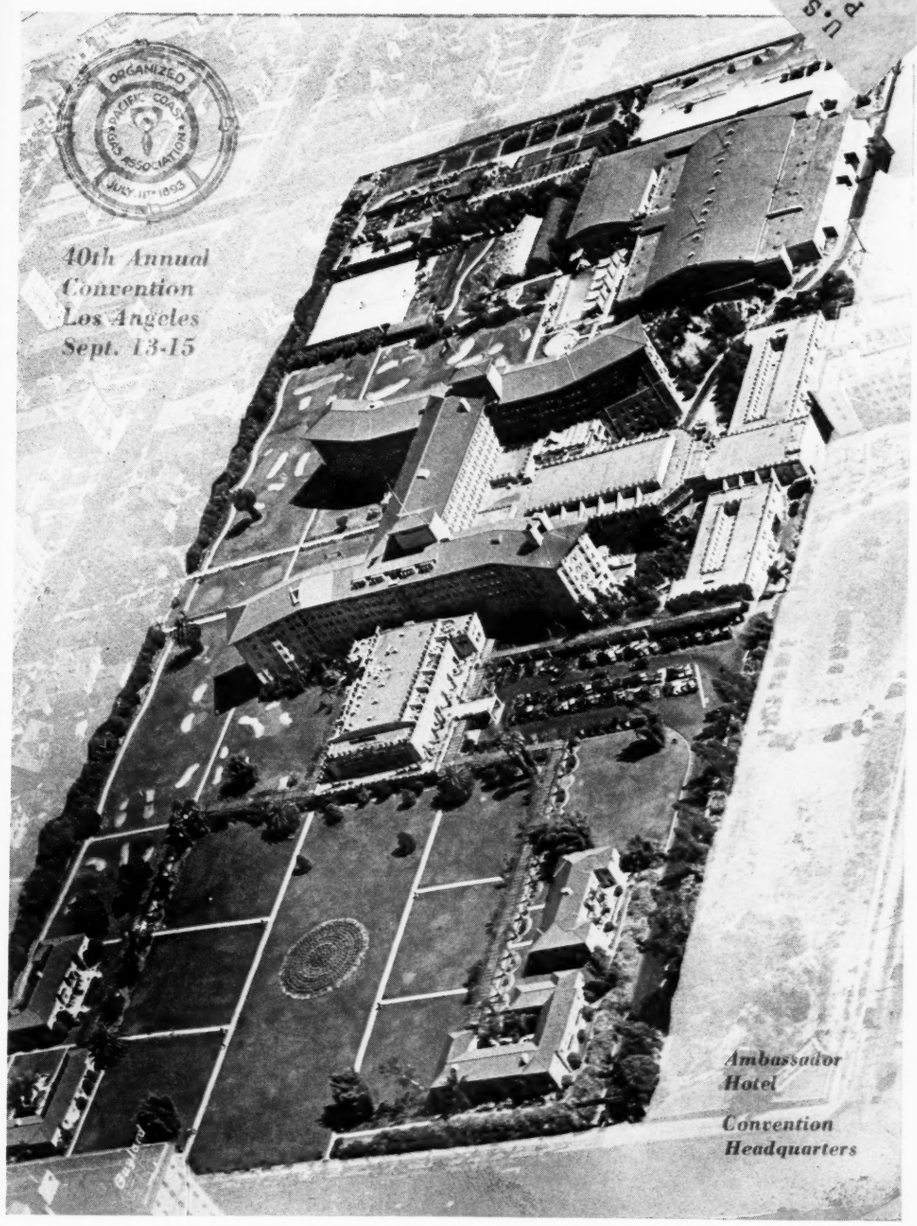
WESTERN GAS

U.S. Geologic
P. O. Box 0
Taft, Calif

5(100)
QW53

August
1933

20 Cents
the Copy



The Pacific Coast Gas Association is setting the stage for its 40th convention, September 13-15, Los Angeles. Ambassador Hotel, seen in air-view above, will be headquarters.

U.S. GEOLOGICAL SURVEY
WASHINGTON
JAN 10 1936
LIBRARY

A MONTHLY JOURNAL DEVOTED TO THE
WESTERN GAS & APPLIANCE INDUSTRIES

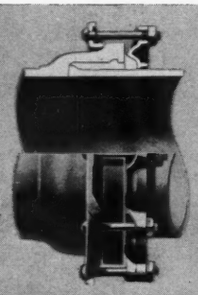
5 ESSENTIALS

IN THE ECONOMICAL AND EFFICIENT CONSTRUCTION AND OPERATION OF GAS LINES

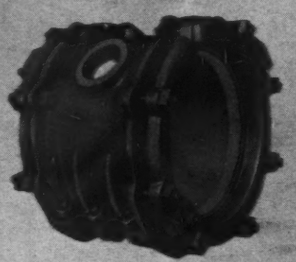
HERE are modern Couplings, Clamps and Sleeves that appeal to the practical gas man. Simple in design . . . they are the development of the world's largest and oldest builder. Easily and quickly installed, they save considerable time and expense in the construction, extension, replacement and repair of gas lines and mains. Flexibility and permanent tightness are attested by nearly half a century of performance records. Write for prices.

S. R. DRESSER MFG. COMPANY
Bradford, Pa.
In Canada: Dresser Mfg. Co., Ltd., 32 Front St., W., Toronto, Ont.

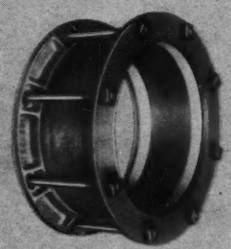
Dresser Cast Split Sleeves, Style 26, will enclose and permanently repair broken bell-and-spigot joints. Rubber side-and-end gaskets, specially designed and compounded, simplify the installation and insure permanence.



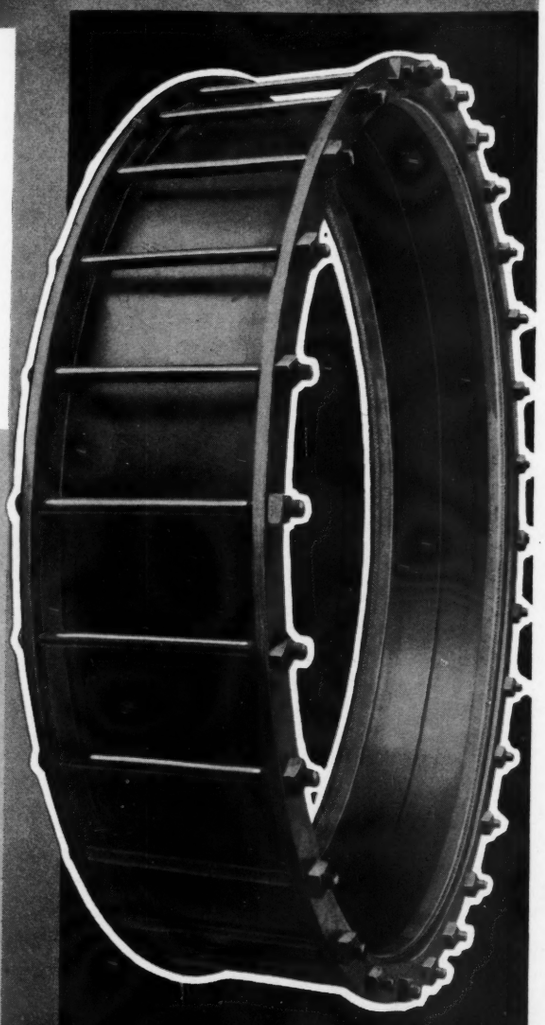
Dresser Bell Joint Clamps, Style 4½-H.P., offer an effective and permanent means of repair for all bell-and-spigot joints.



Dresser rubber-packed Split Sleeves, Style 57, will enclose and permanently repair leaks, breaks and splits in the straight section of cast-iron pipe. Single-unit Sleeve has an inside clearance of 8½" between end gaskets. Two or more units may be joined together.



Dresser Cast Couplings, Style 53, can be furnished for A.G.A. cast-iron pipe up to and including 30-inch. (For larger sizes, Style 38 Steel Couplings are used.)



Dresser Steel Couplings, Style 38, are standard for all kinds and sizes of plain-end pipe: steel, cast-iron, etc., from ⅜-inch to the largest pipe produced.

DRESSERS!

FLUOR

AERATOR-TYPE COOLING TOWERS

ELIMINATE WIND BLOWN SPRAY—

Engineering,
Design and
Installation of
Compressor Plants
Refinery
Equipment
Special Process
Plants
Appraisals
Surveys

•

Established 1890

Vertical Aerator-type construction, as originated by The Fluor Corp, Ltd., has proved itself in the Cooling Tower Field as the only practical method of eliminating wind-blown spray with its attendant corrosion of nearby equipment. More than 5,000 feet of new Aerator-type towers and over 1,000 feet of Louvre-replacement work just completed attests this fact. Specify Fluor Aerator-type Cooling Towers for economy's sake as well as for extreme efficiency under any and all operating conditions.

Houston, Tex.
Washington, D. C.
Chicago, Ill.
St. Louis, Mo.

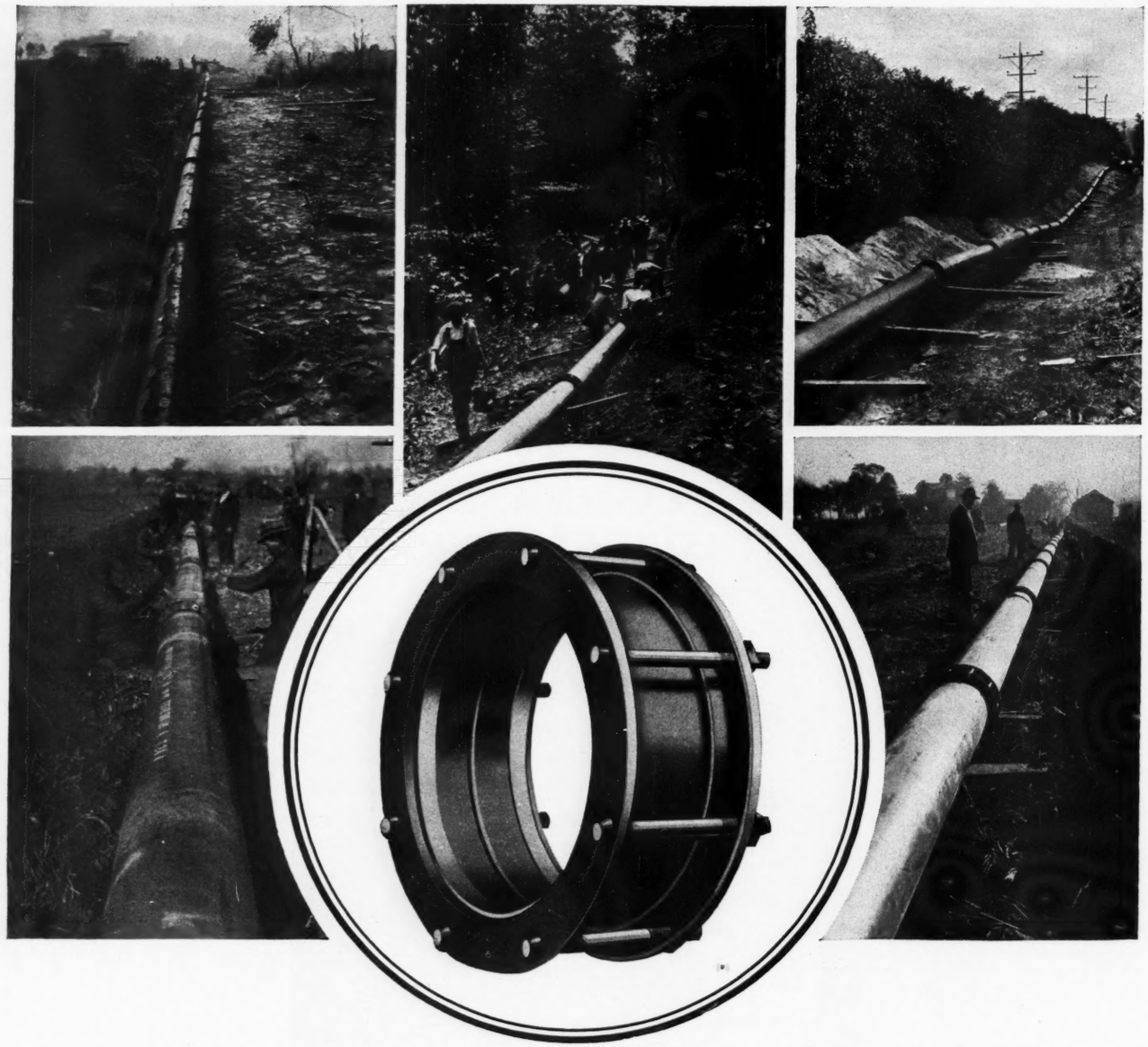
New York, N. Y.
Tulsa, Okla.
Oklahoma City, Okla.
Kansas City, Mo.

FLUOR CORPORATION

• LTD •

909 East 59th Street... ... LOS ANGELES, CALIF.

August, 1933. Volume IX, Number 8. Western Gas is published by Western Business Papers, Inc., at 810 South Spring Street, Los Angeles, California. Subscription price (in advance) 20 cents the copy; $2.00 per year; 2 years, $3.00; $3.00 per year foreign. Entered as second class matter June 1, 1925, at the postoffice at Los Angeles, under the Act of March 3, 1879.



Regardless of the service requirement — original installation in a new pipe line or repair of pipe or joint in lines already in use — wherever pipe is to be connected in a strong, flexible, permanently tight joint, there is a Dayton product that will do the job rapidly, economically and efficiently.

Dayton Couplings have been rendering constant, unfailing service to the gas industry for over a quarter of a century, and their convenience, economy and absolute dependability have made them a permanent investment in satisfaction. The Dayton Pipe Coupling Company, Dayton, Ohio.

Made in all sizes, for every pipe line need.

DAYTON · ALL-STEEL COUPLINGS

Check

THESE FEATURES OF ELECTRIC WELD PIPE

against any other pipe

- 100% WELD ✓
- LONG LENGTHS ✓
- PERFECTLY ROUND ✓
- CLEAN INSIDE AND OUT ✓
- UNIFORM WALL THICKNESS ✓
- STRAIGHTNESS ✓
- FINE FOR EVERY TYPE OF JOINT ✓
- ANY DEGREE OF STRENGTH OR DUCTILITY ✓

Do this and you can't go wrong, whether it's casing or tubing you need for a well, pipe for a long line, or a pipe for the building of a new refinery or the maintenance of an old one.

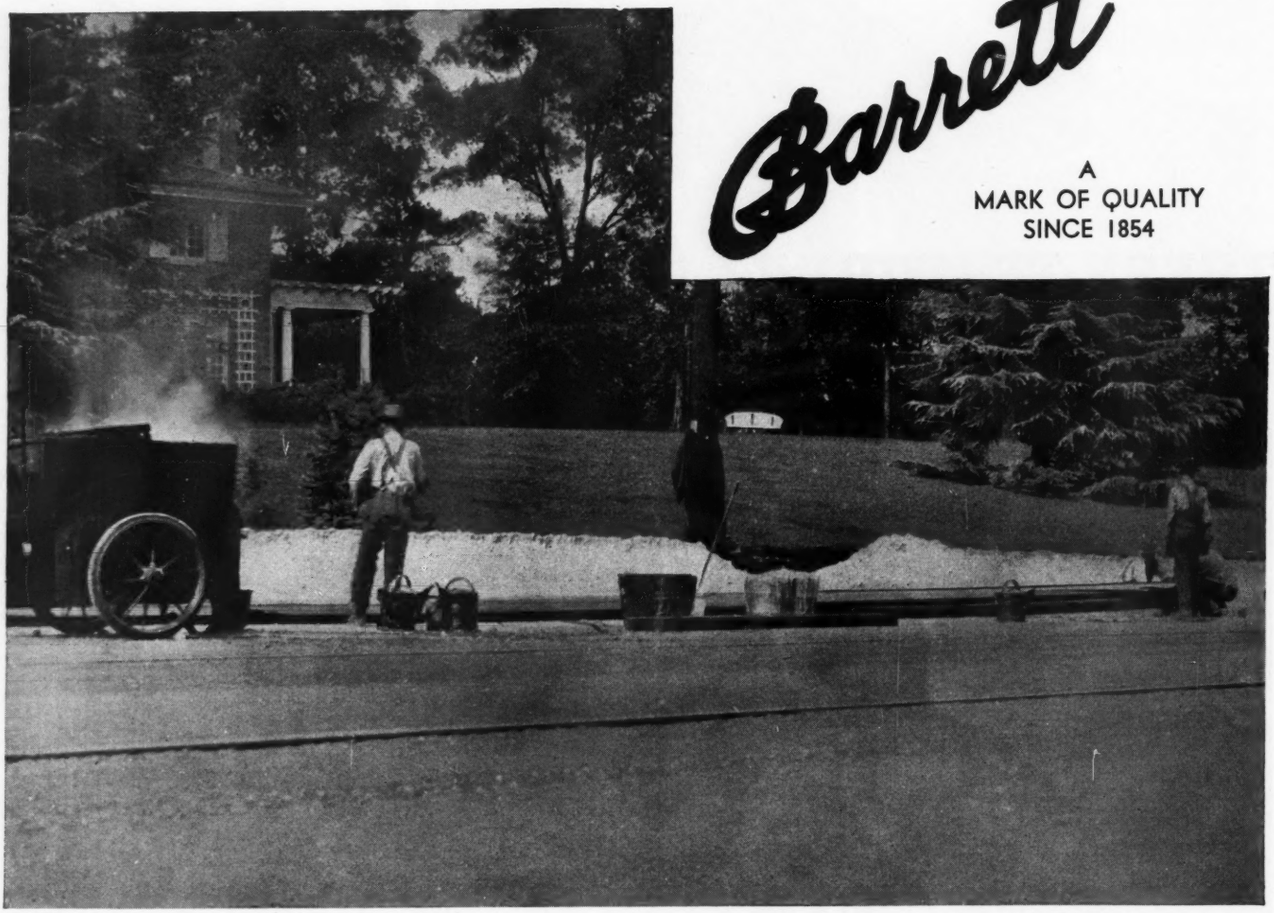
Certainly most pipe has a dependable weld, but Republic Electric Weld is 100 per cent. Some pipe can be had in long lengths—Electric Weld is made up to 50 feet. And as you check the features of this better pipe you will find that while other makes possess some of them, only Republic Electric Weld can honestly claim to have them all.

And it's all in the way it's made. Clean strip is formed cold to a perfect round. The seam is welded by electrical resistance where the edges meet. No metal is added at the weld and the grain structure is virtually the same at the weld as at any other point in the pipe wall. No furnaces to cause scaling. No heating of the entire mass of metal to make it out of round. No long cooling to jeopardize its straightness.

Before you buy pipe check into the advantages that Republic Electric Weld Pipe will bring to your particular work—find out how it will save you time and money. Write for a copy of "Electric Weld Pipe." A reading is convincing.

REPUBLIC STEEL CORPORATION
GENERAL OFFICES YOUNGSTOWN, OHIO

REPUBLIC
ELECTRIC WELD
LINE PIPE • CASING • TUBING



Barrett

A
MARK OF QUALITY
SINCE 1854

A complete protection service for city pipe lines

Barrett Specification

Sub pavement congestion of gas, water, telephone and electric pipes and duct systems and underground structures—frequent digging operations for repairs and extensions—rust and electrolysis eating unprotected pipes thin—these conditions warrant the most effective protective coverings for all city pipe lines.

For economy and efficiency use Barrett Products applied according to Barrett Specifications. Barrett Engineers will gladly cooperate with you in determining the most suitable method of application and the Barrett Products that will give best results—Barrett Pipe Line Enamels, Barrett Service Cement, Barrett Pipe Line Fabric, etc. 'Phone, write or wire.

The Barrett Company

40 Rector Street, New York, N.Y.
2800 So. Sacramento Ave., Chicago, Ill.

PIPE LINE ENAMELS

Service Cement Pipe Line Fabric

Reproduction of the photomicrograph above shows the interlocking of the flakes of the internal reinforcement used by Barrett. By laminating with the waterproofing agent they give Barrett Pipe Line Enamels unusual toughness and resistance to soil stresses.

For pipe of large diameter, The Barrett Company will furnish equipment required to revolve pipe and spread cement.

ADVERTISERS' INDEX

American Gas Products Corp. 34
American Meter Company 6

The Barrett Company 4
H. R. Basford Co. 37

The Cast Iron Pipe Research Assn. —
The Chaplin-Fulton Mfg. Company 37

Dayton Pipe Coupling Co. 2
Dearborn Chemical Co. 34
Detroit-Michigan Stove Company —
S. R. Dresser Manufacturing Co. Second Cover

Electrolux Refrigerator Sales, Inc. Back Cover

Fluor Corporation, Ltd. 1
Fraser Furnace Company 37

Groble Gas Regulator Company 21

Harry F. Haldeman Inc. 35
H. W. Hart Mfg. Co. 36
Hotel Del Mar 36

Johnson Gas Appliance Co. 31

Kerotest Company 22

Manhattan Rubber Mfg. 36
Merco Nordstrom Valve Co. —
Minneapolis-Honeywell Regulator Co. —

Pacific Coast Gas Association 19
Pacific Gas and Electric Co. 29
Pittsburgh Equitable Meter Co. —
PowerStat Corporation 35
Pressed Steel Tank Co. 23

Reliance Regulator Corp. 31
Republic Steel Corp. 3
Reynolds Gas Regulator Company 23
Robertshaw Thermostat Co. 27

Safety Gas Main Stopper Company 35
Savory, Inc. —
Semet-Solvay Engrg. Corp. Third Cover
Wm. B. Scaife & Sons Co. 21
South Chester Tube Co. 37
Southwest Welding and Mfg. Co. —
The Sprague Meter Co. 33

Welsbach Co. 39

WESTERN GAS

"Reg. U. S. Pat. Off."

Publication Office: 810 South Spring Street, Los Angeles, Calif.
District Offices: 110 East 42nd Street, New York; 447 Sutter Street, San Francisco

MEMBER AUDIT BUREAU OF CIRCULATIONS

Contents for August, 1933

Review of the Month 7

Rental Plans for Load-Building 8
By C. B. Babcock

Spring Sales Offensive on Automatic Water Heaters 9
By Jean Scott Frickelton

Pressure Relief Valves for Low Pressure Distribution Systems . 10
By Frank Wright and W. L. McKee

Oklahoma Natural Advertising Meets Timeliness Test 12
By George Goodale

Refrigeration Sales on the Columbia System 13
By B. H. Gardner

PACIFIC COAST GAS ASSOCIATION 14
40th Convention Plans Maturing 14
Edward Campbell Jones—1861-1933 15

Here and There with *Western Gas* 17

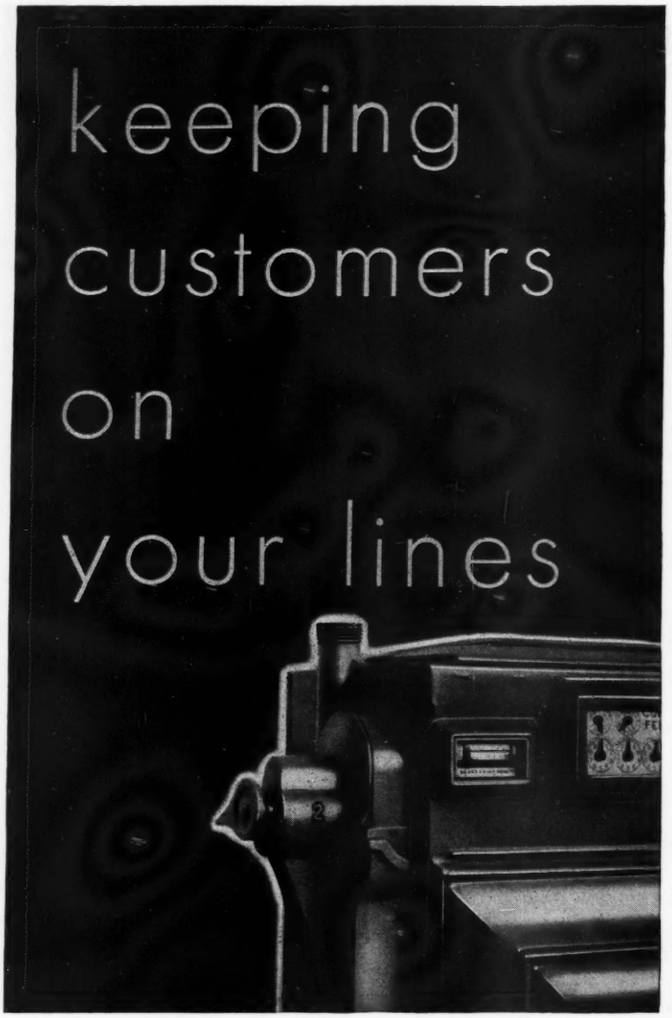
BUTANE-PROPANE NEWS 20
A.G.A. Laboratory Program for Butane-Propane Appliances . 20
By F. R. Wright

MEASUREMENT AND CONTROL 25
Moisture Control for Increasing Domestic Meter Accuracy . 25
By H. M. Crawford

WESTERN GAS is published by Western Business Papers, Inc., 810 South Spring Street, Los Angeles, Calif.

Copyright, 1933, by Western Business Papers, Inc.

JAY JENKINS, Publisher. GEORGE H. FINLEY, Editor. R. C. COLLING, News Editor.
CRAIG ESPY, Eastern Manager. W. G. RUSSELL, Mid-Continent Representative.
OFFICIAL PUBLICATION, Pacific Coast Gas Association; Southern California Meter Association.



● **KEEPING GAS APPLIANCES IN USE and revenue coming in regardless of collection difficulties and economy waves . . . American Meter Company's S. & P. prepayment meter is proving a boon in many localities where credit conditions make its use advantageous.**

First to introduce and perfect such a device in the United States and having sold through the years over three million of these instruments, American Meter Company has become headquarters for prepayment meters.

Bulletin PG 4 describes in detail the function, design and operation of these meters [for both 25 and 10 cent coins]. It will be mailed you on request.

AMERICAN METER COMPANY
INCORPORATED
Measurement and control of Gas, Oil, Steam, Air and Liquids
ESTABLISHED 1836
Meter Trade Names:
AMERICAN — D. McDONALD — METRIC — MARYLAND — PACIFIC — TUFTS
Albany Baltimore Birmingham Boston Chicago
Dallas Denver Erie Kansas City Los Angeles
Philadelphia Pittsburgh New York San Francisco Tulsa

August, 1933

WESTERN GAS

"Reg. U. S. Pat. Off."

Vol. IX, No. 8

A Monthly Journal of the Gas and Gas Appliance Industries in *Western America*

Review of the Month

Organization Progress for Industrial Recovery

MAIN developments in the gas appliance industry's program under the National Industrial Recovery Act were covered in their earlier stages in the July *Western Gas*. Since that issue came from the press the Cincinnati meeting, held July 17 and 18, brought together a very representative assemblage of manufacturers and advanced the organization work measurably. There has now come into being a Gas Appliance Institute, comprised to date of the following member institutes: The Gas Range Institute (surveyed in last month's issue), the Gas Water Heater Institute, the Gas Furnace and Boiler Institute, and the Gas Space Heater Institute. By-laws and basic codes of fair competition have been adopted by each of the institutes, and further work is proceeding steadily to the end that codes may be brought into the National Recovery Administration at the earliest possible moment. Further organization of gas industry manufacturing branches, including the equipment manufacturers, is to be anticipated soon.

The industry's manufacturers, and its organizations—particularly the American Gas Association and the Pacific Coast Gas Association, which have recognized the need for leadership in a most effective manner—are in line for commendation for their promptness in seeking to come within the scope of the Act. Manufacturing firms and individuals are sparing neither time nor expense in furthering the organization work, which is calling for innumerable conferences and much cooperative action.

Code preparation under the NIRA is penetrating almost every industry. Periodical publishers, incidentally, are in the vanguard of the movement; many business and general publications, *Western Gas* among them, have already signed membership agreements looking to the organization of a Periodical Publishers Institute and adoption of a code of fair practices.

Meanwhile, adoption of blanket codes by thousands of individual firms throughout the country under the President's Reemployment Agreement is providing a temporary basis for business revival, pending consummation of the separate industrial codes.

Ready to Capitalize on Improved Opportunities

Bettered business opportunities find both gas companies and manufacturers with decks cleared for action. Sales departments are operating at higher efficiency than in the boom days, due to the strenuous demands of the last three years; there is a general appreciation that order-taking is a thing of the past —a determination to go back to first principles and sell gas equipment on the basis of the superiority of gas service. Already sales departments are reporting greatly improved sales results, in refrigeration, ranges, and other domestic classifications. Industrial load has been returning to the lines generally throughout the country. Househeating equipment should have an excellent summer and fall season.

Manufacturers are quoting new prices which should allow for legitimate profits, and which the industry should welcome as a sign of return to normal.

Depression days have emphasized in a way that the industry is not likely to forget, the importance of the domestic load. The industry knows where its efforts must be centered, and knows better than before the nature of its competition. Oil and coal competition will be relatively less severe as these industries emerge from distress conditions; also, the industry is now alert to electric inroads, and is determined to check them effectually.

Undoubtedly there has been much postponement of normal maintenance and extension of service facilities throughout the industry, and new projects have necessarily awaited return of normal financing. In these directions also the gas industry will make contribution to the upswing of business.

Give the Public the Facts on the Tax Burden

Federal, state and local taxes are coming under closer scrutiny this year; among utilities there is an encouraging tendency to "do something about it," as regards the ever-increasing portion of revenues which go into the tax coffer.

The most obvious thing which can be done is to see that the public knows some basic facts about taxes as they affect utilities—what portion of the utility income goes out in taxes, how little utility services cost when compared to public expenditures, and similar fundamentals.

Information of this sort is being more generally disseminated than ever before, and this is in the right direction. A recent report to share holders of a large public utility organization pointed out that a reduction of only 15 per cent in state and local expenditures, for the country as a whole, would save the public an amount equal to the total cost of its domestic gas and electric service combined.

On the current gas bills of another large utility there is appearing a statement that the company's taxes require an average amount of 56 cents for every monthly gas bill rendered—an item of expense over which the company has no control.

Rental *and* Sales-Rental Plans *for* Load-Building

By C. B. BABCOCK

*President, C. B. Babcock Company**

THE rental of gas appliances is not entirely a new idea, as it has been practiced by English gas companies for many years and has proven to be successful and profitable. In Table No. 1, I am submitting a list of a few English gas companies, giving a good cross section of results achieved.

C. B. Babcock

In these figures may be noted the great number of prepay meters in operation in England. In each case they include free appliances, that is a radiant heater, water heater, incinerator and gas range. The gas company installs all of these free with the prepay meter. This is substantially a rental proposition though the public is unaware of it. Where the rent comes in is in the short measure of gas that the meter delivers. That is, the consumer is charged on the basis of 1000 cubic feet of gas, whereas the meter delivers only 800 cubic feet, this difference taking care of the rental charge of the appliance.

There are many advantages to the use of prepay meters in this connection. Ease of collection, and the use of the gas appliances limited only to the consumer's ability to pay are among the important ones. This plan also gives the gas company a competitive advantage against other fuels, and makes possible the use of load building appliances in territories where the consumer has a very limited income.

New England gas companies for a number of years have looked with favor upon the rental plan, and in 1927 the New England Regional Gas Sales Conference accepted and unanimously approved a report from a committee charged with the investigation of this subject.

Many gas companies in the United States have used the rental plan with success. The Consumers Power Co. of Michigan, the Northern Indiana Power Co., and others have found it to be particularly desirable in creating a larger use of radiant heaters.

A brief analysis of the financial aspects from the standpoint of investment, sales cost, and load building is desirable.

Investment:

One 10-radiant gas heater—cost	$8.50
Commission to salesmen	2.00
Installation cost	3.00
Total capital invested	$13.50

Annual Charges:

Interest at 8%	$1.08
Amortization and depreciation (5 year life)	2.70
Maintenance (elements, etc.)	1.00
	$4.78

In other words, $4.78 per year will pay the company its interest on the money invested in the heater and allow for the cost of its maintenance, and pay this investment back in a five-year period. This would be covered by a rental of 40 cents per month if on an annual contract. A higher rental should be charged if rental is for a more limited period or to cover idle periods.

In the meantime the heater is being used and the company is deriving revenue from the gas sold. This gas might well total 25,000 cu. ft. of manufactured gas per year, which would yield an annual gross revenue of $25 at $1.00 gas, a net revenue of approximately $7.50 (operating ratio of 70), which in itself is a 5 per cent return on $150.00 invested per consumer.

It does not require much calculation to determine the excellent load-building qualities of the plan as outlined. The small investment required and the net profits from the sale of gas are self evident. One hundred radiant heaters is equivalent to an annual gas consumption of 2,500,000 cu. ft.

A modified plan may be adopted. Through a combination sales rental the consumer may be given the privilege of converting the rented appliance to a sale or outright purchase. Credit should be given the consumer for the first year rental payments, to apply on the

(Continued on Page 32)

* Presented before the Pacific Coast Gas Association's Northwest Conference, Seattle, Wash., June 22-23, 1933.

TABLE NO. 1

Name of Company	*Total Consumers*	*Prepay Meters*	*Radiant Heaters*
London Gas Light & Coke Co.	1,207,520	664,331	359,365
Hornsey	22,294	7,812	12,998
Lea Bridge District	34,812	20,578	4,720
North Middlesex	18,303	3,641	11,753
South Metropolitan	413,957	311,044	135,346
South Suburban	105,460	46,559	46,215
Tottenham District	98,078	66,322	13,393
Leeds	131,055	72,318	20,172
Manchester Corp.	209,230	90,189	52,933
Liverpool Gas Co.	197,741	108,851	20,025
	2,438,450	1,391,555	676,920

ARE YOU PLAYING FAIR
with your
TEA
KETTLE
?
You wouldn't ask a boy to do a man's job... don't expect a kettle to do the work of a boiler...
You can have HOT water... all you want day or night at the turn of a faucet...
Simply install a thrifty new Two Set Action GAS WATER HEATER
It operates for a few pennies a day automatically
HOT WATER Instantly as if by magic
HERE..OR AT YOUR DEALERS...

P. G. and E. window display card used during recent water heater drive in Northern California.

Spring Sales Offensive Puts 4,179 Automatic Water Heaters *to* Work

By JEAN SCOTT FRICKELTON

Gas Appliance Society of California

STARTING in the bleak spring of 1933, a time which will go down in history as the period of the great bank holiday, the Annual Spring Automatic Gas Water Heater Campaign, conducted by the Pacific Gas and Electric Co. and cooperating manufacturers and dealers, resulted in the sale of 4,179 automatic water heaters at a total of $335,000. This is the information given out in a final report on the campaign, February 26 to June 10, by A. C. Miller, domestic sales engineer of the Pacific Gas and Electric Co., who planned this signally successful business-building drive under the direction of H. M. Crawford, general sales manager.

The necessity for such a campaign was very evident from the beginning of 1933, when the forecast for business was the darkest in many years and the country seemed in the depths of the depression. To organize the campaign a series of meetings were held at which the utility, with leading manufacturers and dealers, decided upon campaign features and terms which could be advertised, and other details. It was decided that efforts should be concentrated on the replacement of non-automatic water heaters. After the program was agreed upon the utility's plan, which included a substantial advertising campaign, was perfected.

The utility decided to restrict its sales to the replacement of non-automatic water heaters or heaters using other fuels than gas. The new building field and the replacement of automatic water heaters were left entirely to dealers.

A. C. Miller

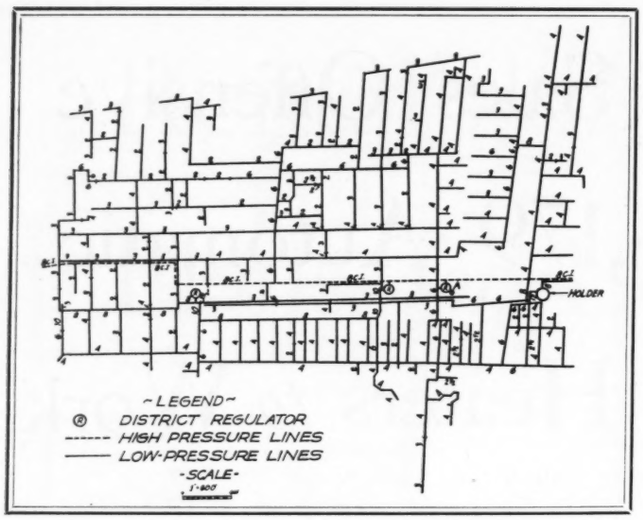
The utility also restricted its sales activity to the higher grades of heaters having installation prices of $90 or more. It was agreed that minimum advertised terms on an automatic water heater would be $4.85 down and $3.85 per month. On the larger sizes of automatic water heaters the down payment and monthly installments were increased proportionately.

When the advertising program was ready for announcement, a series of 12 cooperative dealer meetings were conducted by representatives of the Pacific Gas and Electric Co. throughout the larger cities in Northern California. A complete analysis of the potential market for the sale of automatic water heaters was given. One outstanding fact pointed out to the dealers was that 300,000 consumers in the Pacific Gas and Electric Co.'s territory were not using automatic water heaters, 80 per cent of these (or 240,000) using tank heaters. The annual replacement market on these 240,000 tank heaters, normally set at 24,000 a year, it was also pointed out, could result in annual sales of automatic water heaters amounting to $1,800,000. This presentation also included a graphic comparison of the cost of heating water with a modern automatic gas water heater as contrasted with water heating by obsolete methods such as tank heaters, non-automatic combination heaters and the tea kettle.

A complete summary was given dealers on the $75,000 advertising program which would be the Pacific Gas and Electric Co.'s contribution during the special campaign period. This promotional advertising consisted of space equivalent to 301 full newspaper pages, all copy being directed at the replacement of non-automatic water heaters. The sales message carried the idea of the convenience and necessity of automatic hot water in the home. In no way did the copy mention specific makes of heaters. This permitted any dealer to run tie-in advertising on his particular make and to benefit by the large copy used by the Pacific Gas and Electric Co., all of which carried the message "see your dealer or the P. G. and E." An elaborate billboard campaign was also planned to include 356 large poster boards placed at strategic locations throughout the territory. A duplicate billboard in a smaller size was prepared and placed on 830 of the company's service trucks. The billboard was also reproduced in miniature form as bill-stickers which were used on some 1,000,000 gas bills mailed during the campaign period.

The whole purpose of presenting all this material direct to dealers at these meetings was to develop their interest, familiarize them with the potential business and to provide them with information which would aid in closing sales. In order to continue to keep dealers informed as to the program of the campaign, a monthly dealer bulletin was issued, which in addition to sales suggestions, gave a complete schedule of advertising plans, including photographs of newspaper ads and billboards to be run during the month, together with the dates of issue.

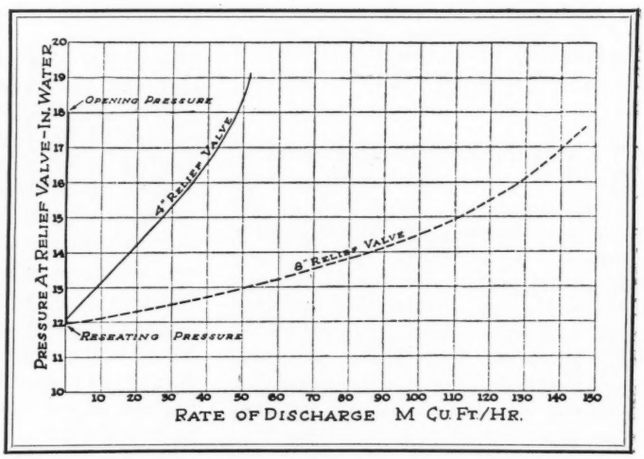
(Continued on Page 33)



Pressure Relief *for* Low Distribution

FIG. 1. (Above) Section of low pressure distribution system at Santa Monica, Calif.

FIG. 2. (At right) Operating characteristics of relief valves.



LOW-PRESSURE distribution systems are usually protected from dangerously high pressures by floating a low-pressure holder on the system or by installing a water seal or a dead weight relief valve. Usually one such device located anywhere on the system and having a capacity sufficient to care for leakage through regulator valves during the night hours is considered adequate.

Under certain conditions, however, additional precautions may be advisable. A series of tests were conducted in the Southern Counties Gas Co. laboratory, in which the operation of a large variety of appliances, all adjusted for 8 inches of water pressure, was studied as the gas pressure was increased to 50 inches of water. Although many appliances were found to operate without creating a fire hazard at 50 inches of water, there were a few that became very dangerous at much lower pressures. As a result of these tests, we have decided that even in an emergency we cannot permit the pressure on our low-pressure distribution systems to go above 20 inches of water.

As the result of a detailed study of the capacity of lines leading to and from our district regulators, it was further concluded that in order to adequately protect our low-pressure distribution systems from any accident that caused the valves of a low-pressure regulator to remain wide open or nearly so, it would be necessary in general to install a pressure relief valve of considerable capacity at the outlet of each district regulator.

The necessity for having a relief valve at the regulator outlet rather than at some distant point arises from the lack of capacity of the low-pressure lines into which the regulator feeds to carry away the gas that would flow into the low-pressure system. A low-pressure holder riding on the distribution system at a distant point or a pressure relief device located at a distant point in most cases cannot prevent the pressure from building up to a dangerous point in the territory immediately surrounding the regulator.

Determining Relief Valve Sizes

The following example illustrates our method for determining the required size of a relief valve at any given regulator station.

The lay-out of a portion of one of our low-pressure distribution systems is shown in Fig. 1. (A) is a 4-inch regulator located only 1200 feet from a low-pressure holder. The normal inlet pressure at this regulator is 3.5 lbs. per sq. in. A study of the distribution network between this regulator and the low-pressure holder discloses that it has a capacity for carrying gas from the regulator to the holder equivalent to that of an 8-inch pipe 2880 feet long.

If the valves of the regulator are held open, the pressure at the regulator outlet will, of course, build up until the capacity of the distribution system to carry gas to the holder equals the capacity of the regulator. In this particular case the distribution system capacity equals the regulator capacity when the regulator outlet pressure is 38 inches of water. With 3.5 lbs. per sq. in. on the inlet and 38 inches of water on the outlet, the regulator will pass 56,500 cu. ft. of 0.65 gravity gas per hour, and the distribution system (equivalent to 2880 feet of 8-inch main) will, with an initial pressure of 38 inches and a terminal pressure of 8 inches, pass the same quantity.

In this case, therefore, if no provision for pressure relief other than the holder is provided, there is a possibility that the pressure in that portion of the low-pressure system that does not lie between

Valves Pressure Systems

By FRANK WRIGHT
and W. L. MCKEE

Southern Counties Gas Company
Los Angeles, California *

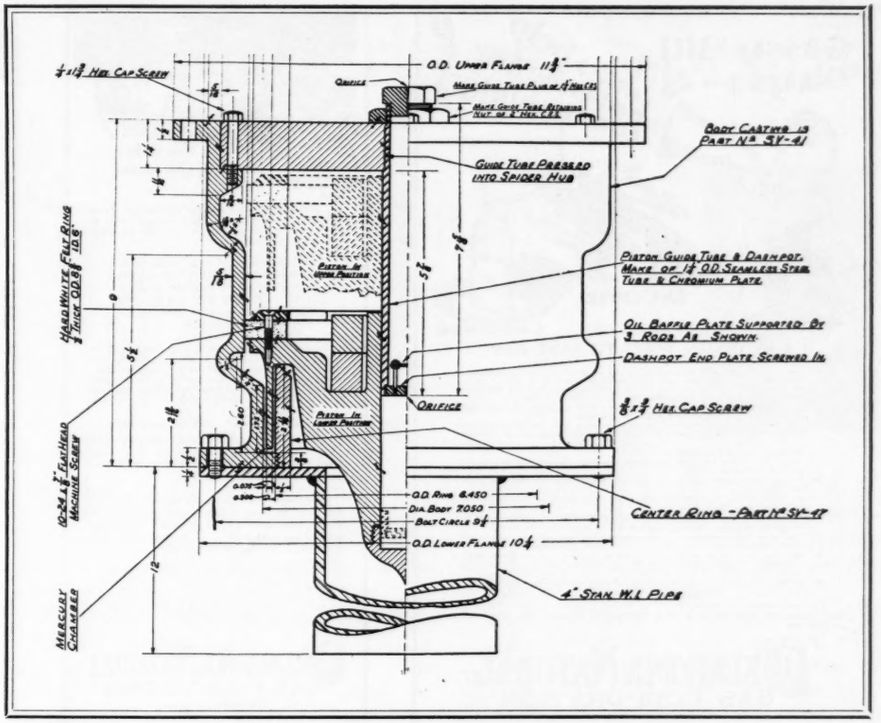


Fig. 3. Cross section of 4-inch relief valve.

the regulator and the holder will build up to 38 inches of water.

Assume for the moment that we want to limit the possible build-up of pressure to 20 inches of water. With 20 inches initial and 8 inches terminal pressure, 25,000 cu. ft. of gas per hour can be conducted from the regulator to the holder. The regulator capacity with 3.5 lbs. per sq. in. inlet and 20 inches of water outlet pressure is 65,000 cu. ft. per hour. It is then necessary to install at the regulator a relief valve having a capacity with a 20-inch inlet pressure of 65,000 minus 35,000 or 30,000 cu. ft. of gas per hour.

This example illustrates one case where a low-pressure holder riding on a distribution system does not give complete protection from high pressures, even though it is located quite near the district regulator.

A remotely located pressure relief valve will give even less protection than a remotely located holder. The reason for this can be found by referring to Fig. 2, which shows the operating characteristics of the valves we use. Assume that in the case just discussed a 4-inch relief valve is substituted for the holder. Fig. 2 indicates that if a 4-inch valve is weighted so that it will open at 18 inches it will not reseat until the pressure has been reduced to 12.3 inches and will not pass any gas unless the pressure is greater than 12.3 inches.

Therefore, in the above example, if a relief valve instead of a holder is used, the terminal pressure used in calculating the capacity of the distribution system to carry gas to the relief valve cannot be 8 inches but must be the pressure at which the valve will discharge the gas delivered to it by the distribution system. By a series of trial-and-error calculations it can be shown that the capacity of 2880 feet of 8-inch pipe with a 20-inch initial and 14.5-inch terminal pressure is 23,000 cu. ft. per hr. and equals the capacity of the 4-inch relief valve when the gas pressure at the valve is 14.5. Therefore the relief valve *at the district regulator* must have a capacity in this case of 65,000 minus 23,000 or 42,000 cu. ft. per hr.

There are sometimes cases where a number of district regulators supply the same distribution system where it is not necessary to install relief valves at the outlet of all of the regulators because the distribution system can dispose of the gas coming from one regulator by carrying it to a number of relief valves widely scattered through the distribution system. Such instances, however, are seldom found.

We have adopted the policy, therefore, of installing pressure-relief valves at the outlet of all low-pressure district regulators where calculations such as those given above indicate that they are necessary.

We set our relief valves to open at 18 inches of water and install valves of adequate capacity to prevent the pressure from building above 20 inches of water.

Description of Relief Valve Adopted

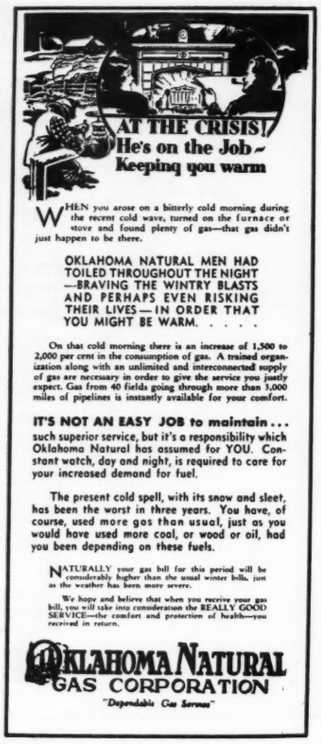
The relief valve adopted as being the one best suited for the purpose is of the dead weight, mercury seal type. This valve was designed and perfected by company engineers and is built in our own machine shop. A cross section of the valve is shown in Fig. 3. The distribution system pressure acts upon the bottom of a piston set in a mercury seal. When the force exerted on the piston by gas pressure exceeds the weight of the piston, the piston rises out of the mercury and continues to rise until the felt ring reaches the flared portion of the cylinder, or body casting. Gas then escapes into the vent. A dash pot is provided to keep the valve from hammering.

In the 4-inch valve the gas pressure acts over an area of 37.4 square inches before the mercury seal is broken and over an area of 50.2 square inches after the mercury seal is broken. As a result, the reseating pressure of the valve is several inches lower than the opening-pressure. In Fig. 2 operating characteristics of the valve are shown. This change in piston area after the mercury seal has been broken is advantageous for the following reasons:

(Continued on Page 30)

*Presented before the Spring Conference of the Pacific Coast Gas Association's Technical Section, Los Angeles, March 2-3, 1933.

Gassy Bill Says:—
Let us help balance the family budget
INCOME
EXPENSE
BY TELLING YOU
ONE DOZEN WAYS TO SAVE GAS
1. Correct temperature should be maintained by the aid of thermometers or thermostats. Thermostats on gas appliances regulate temperature by controlling the flow of gas to the burners. The correct temperature for living room varies somewhat with individuals and conditions, but it is generally considered to be about 66 to 68 degrees F.
2. A cooking utensil should be ready to be placed over the burner before it is lighted, and the gas should be turned off when cooking is completed.
3. When water has come to a boil, the fire should be turned down, and just enough heat should be supplied to keep the water boiling. It causes needless evaporation of water and thereby wastes gas.
4. No more water should be heated than is needed.
5. The careless, wasteful use of hot water should be avoided, and leaky hot water faucets should be repaired immediately.
6. All parts of the burners should be kept clean, and they should be adjusted to give steady blue flames.
7. The supply of air at the burner should be just enough to provide for complete combustion. An excessive supply of air causes loss of heat.
8. The appliances and distributing pipes should be well insulated to prevent heat waste.
9. For cooking, the burners should be clean and adjusted to give short blue flames.
10. Most of the heat transferred to a cooking utensil comes from the higher parts of the flame; consequently, short flames use gas more efficiently than long ones.
11. Place your cake tins, one on the top rack, one on the lower rack, not directly under each other, and about three inches from the oven sides and oven back. This will save you fifteen percent on your gas consumption.
12. See that all appliances are properly adjusted and check your lines for leaks.
Your gas company is anxious you receive the most from your service at the lowest cost. Our engineers and service men are always at your disposal to assist in the solution of your gas problems.
OKLAHOMA NATURAL GAS CORPORATION


AT THE CRISIS!
He's on the Job—
Keeping you warm
WHEN you arose on a bitterly cold morning during the recent cold wave, turned on the furnace or stove and found plenty of gas—that gas didn't just happen to be there.
OKLAHOMA NATURAL MEN HAD TOILED THROUGHOUT THE NIGHT —BRAVING THE WINTRY BLASTS AND PERHAPS EVEN RISKING THEIR LIVES — IN ORDER THAT YOU MIGHT BE WARM. . . . .
On that cold morning there is an increase of 1,500 to 2,000 per cent in the consumption of gas. A trained organization along with an unlimited and interconnected supply of gas are necessary in order to give the service you justly expect. Gas from 40 fields going through more than 3,000 miles of pipelines is instantly available for your comfort.
IT'S NOT AN EASY JOB to maintain . . . such superior service, but it's a responsibility which Oklahoma Natural has assumed for YOU. Constant watch, day and night, is required to care for your increased demand for fuel.
The present cold spell, with its snow and sleet, has been the worst in three years. You have, of course, used more gas than usual, just as you would have used more coal, or wood or oil, had you been depending on these fuels.
NATURALLY your gas bill for this period will be considerably higher than the usual winter bills, just as the weather has been more severe.
We hope and believe that when you receive your gas bill, you will take into consideration the REALLY GOOD SERVICE—the comfort and protection of health—you received in return.
OKLAHOMA NATURAL GAS CORPORATION
"Dependable Gas Service"

3
12
MONTHS OUT OF
JAN. $11.48
FEB. $9.30
DEC. $9.00
YOU PAY A HIGH GAS BILL
YOU PAY A VERY LOW GAS BILL
JUNE $1.44
$1.17
$1.12 AUG.
JULY
AND THE REMAINING SIX MONTHS:
(These figures, as well as those in above circle, are the average result of an actual survey of six-room houses from scattered points of the Oklahoma Natural system over a year's time.)
March . . . $6.15
April $3.05
May $2.07
September $1.48
October . . $2.75
November $7.29
And for the year—$56.30!
Just Suppose That Average Bill Was Divided Evenly Over the 12 Months?
You Would Pay
LESS THAN $5 PER MONTH
It is unfortunate for your gas company that it's bills vary according to conditions and you cannot pay them like you pay for other necessities—the grocer, and the landlord or other creditors whose bills vary only slightly from month to month.
A glance at the above averages reveals that you pay MORE THAN ONE-HALF YOUR YEAR'S GAS BILL IN THREE MONTHS—December, January and February, totaling $29.78. And you have NINE MONTHS in which you pay the rest.
Of course it is impossible to bill you evenly each month. We wish with you that this fluctuation in the size of your gas bills could be avoided. But please remember how little you pay for good gas service under the Oklahoma Natural's domestic rate of only 45 cents per thousand cubic feet.
OKLAHOMA NATURAL GAS CORPORATION

Three samples from the winter advertising messages of Oklahoma Natural Gas Corporation.

Oklahoma Natural's Advertising Meets the Test of *Timeliness*

By GEORGE GOODALE

Oklahoma Natural Gas Corporation

NOT so unusual in copy content or methods of procedure, but differing, through its human simplicity, from the usual type of public utility advertising—is perhaps a fair description of the Oklahoma Natural Gas Corp.'s advertising program.

The territory reached by Oklahoma Natural's advertising is distinctly different from most other parts of the United States, from a publicity viewpoint. An abundance of gas in the backyards, so to speak, and Oklahoma's anti-utility merchandising law, are two factors which set up unique conditions for an advertising program. Because of the neighboring gas fields customers are unable to understand the domestic rate of 45 cents per thousand cubic feet charged by the company. And of course the merchandising ban makes direct sales advertising by the company nil.

Last December when the winter's advertising was being planned, these and other special conditions in the state had to be carefully diagnosed. The company's advertising budget was limited, but at the same time large enough to enable the advertising force to reap many advantages if the money available was used wisely.

George Goodale

Then it came time for thought on subject matter. From a dozen to two dozen topics were selected for comment, and their essentials briefly listed. It was decided to use the topic which best fitted the occasion as current events took place, and this policy has brought good results.

All copy and illustrations were simple and no elaborate comparisons were drawn. The copy merely stated facts, and endeavored to present the company's side of the story in a human and conversational way.

The company was able to advertise at regular intervals in every newspaper on its system, numbering more than 100, by use of different size advertisements. The large dailies of Tulsa and Oklahoma City carried three column by 10 inch ads while the dailies in the smaller cities carried ads measuring two columns by 10 inches. The host of country weeklies, and weekly papers in the larger cities, were also used regularly with two column by six inch copy.

The subject material of each size ad was the same, although space limitations naturally made the smallest ad less complete in copy.

The first ad of the current program was released in December and used no

(Continued on Page 34)

Air-Cooled Refrigerator Speeds Columbia System Sales

By B. H. GARDNER

Director of Sales
Columbia Engineering Corporation

GAS appliance sales have shown a remarkable increase in recent months over the Columbia System. Reviewing this trend, I am reminded of the little locomotive going over the hill. As it neared the top, its task became increasingly difficult and it chugged, "I think I can," much slower. So it was with our gas appliance sales as we emerged from the Banking Holiday.

We felt that we had crossed the divide of sales resistance but that something was needed to start the wave of buying. About this time the factory commenced to ship the new air-cooled Electrolux gas refrigerator. Truthfully, we never had felt that the water feature was a serious objection among our customers, but removing it gave us a new selling point to enthuse both customer and salesman.

For our Columbia Group we set up a quota of 375 gas refrigerators to be sold between April 3 and June 3. This was a high goal considering that our total sales for the 12 months of 1932 amounted to only 488 gas refrigerators.

LESS THAN 3¢ A DAY TO OPERATE!
The Big Parade IS ON
ELECTROLUX
Enthusiastic Acceptance of Gas Refrigeration Sweeps The Country!
Think Of It! The Finest Refrigeration Available Actually Is Least Expensive!
Take No Chances on Delay and Disappointment · · ·
Order Your Electrolux Now To Insure Prompt Installation!
THE GAS COMPANY
Gas Doesn't Cost . . . It PAYS!

Forceful advertising supported the Columbia System's nine-week drive on gas refrigeration.

Cash prizes were announced for the high salesmen of the nine-week contest as well as leaders for four of the weeks scattered through the campaign.

During the sales drive a special bulletin was used to report the progress of our districts and salesmen. It was called "Front Line Flashes," and the theme was to compare the gas refrigerator campaign to a war in which salesmen were fighting to capture orders. Timely selling information and prize announcements also appeared in this bulletin.

Newspapers formed the main column of the advertising, supported by truck posters and tire covers. The first advertisements introduced the new Electrolux and stressed the features of improved gas refrigeration. As the demands on the factory increased and it was unable to make prompt shipments, a sales point was made of the situation and customers were urged to buy at once to avoid the inconvenience of delayed installation. Later, the "Join The Big Parade" idea was emphasized. "Gas Refrigeration Costs Less Than Three Cents a Day" was the slogan carried throughout the advertising campaign.

At the end of the first week the total sales of the Columbus Group was exactly on quota schedule, with 42 gas refrigerators sold. From that time on, the sales exceeded this figure by a wide margin and we ended the nine weeks with 722 units sold—192 per cent of the quota—147 per cent of the Group's sales for the entire 12 months last year.

From June 3 to July 1 a clean-up campaign was conducted that equaled the original sales drive for intensity. During this time 356 units were sold. This brought refrigeration sales for the first six months of 1933 in the Columbus Group to a total of 1299.

Not only has the Electrolux campaign been profitable in itself, but also it has helped other lines of merchandise by proving to the sales force that a good demand exists for quality goods. From May 15 to July 1, inclusive, the Columbus Group conducted a Tappan gas range campaign along with their efforts on refrigeration. During this activity a total of 550 gas ranges was sold.

In the Pittsburgh Group of the Columbia System we started general educational meetings during the week of March 27, followed in April and May with a series of employee meetings.

In these meetings, we endeavored to educate first, all of the salesmen, and later, all of our employees, to the value of the Electrolux from the standpoint of profitable sales; also from the standpoint of building additional base load.

During this period, we published a weekly bulletin under the title of "Refrigerania" with a slogan of "Beat Last Week."

The campaign was splendidly supported by every employee in the organization as can readily be seen from the results. During 1932, we had sales of only 123 refrigerators for the 12 months' period. In the first three months of 1933, we had sales of 33 refrigerators; in April 1933, sales of 132 refrigerators, followed by 166 refrigerators for the month of May.

For June the quota was set at 300 sales for the 30 day period. This was almost the equivalent of the two best months we had ever had. During the month, the Sales Department devoted its entire time to the sale of refrigerators. Also, the Sales Department was splendidly supported by all other departments of the Company. The efforts for the month resulted in the total sale of 336 refrigerators, almost three times as many in the month of June, 1933, as were sold in all of 1932.

The combined sales of the Columbus and Pittsburgh Groups for the first six months show 1966 refrigerators sold. These represent retail sales to individual customers, there being no apartment house sales. Refrigerator sales are still being pushed, with every indication that our efforts will meet with continued success.

Pacific Coast Gas Association

Managing Director: Clifford Johnstone
Association Headquarters:
447 Sutter Street, San Francisco

President: H. L. Masser
Vice-President and Executive Engineer,
Los Angeles Gas and Electric Corp.

Committee for 40th Annual Convention Busy With Arrangements

CONVENTION arrangements were decidedly advanced at a meeting of the General Convention Committee held recently. General Convention policy was decided upon and the general outlines of the Convention took form.

In keeping with the spirit and necessities of the times, the Convention will be one to intrigue the interest of those seriously charged with the responsibilities of the gas industry. The program will be laid along the lines parallel to the needs of the business.

D. L. Scott
General Chairman

The three days of the Convention proper, September 13, 14, and 15, will be unbroken by any feature calculated to divert from the problems under discussion. Sports events, under the chairmanship of A. L. Spring, will be so planned as not to consume time properly belonging to Convention sessions. The annual golf tournament will be held on the morning of Saturday, the 16th, after all sessions have completed their work.

From this it is not to be inferred that the Convention will be dull and prosaic. In fact, the Committee felt that this year it is favored with the elements of unusual convention interest, in the consideration of the problems confronting the industry under the trying conditions that have prevailed for the past few years.

The time of the Convention will be allotted according to the following schedule:

Wednesday

Forenoon, general sessions; noon, fellowship luncheon; afternoon, parallel sessions; evening, dinner and president's reception.

Thursday

Forenoon, general session; noon, men's speaking contest; afternoon, parallel sessions; evening, section dinners and parallel sessions.

Friday

Forenoon, general session; noon, fellowship luncheon; afternoon, general session; evening, annual banquet.

Saturday

Forenoon, annual golf tournament.

Dances on Wednesday and Friday evenings, following the president's reception and the annual banquet. Further Convention information will appear in next month's issue of *Western Gas,* and also in a pre-Convention circular to the membership of the Association about September 1st.

It has been decided by the Board of Directors that there will be no registration fees this year. A bridge luncheon will be arranged for visiting ladies, and also there will be other diversions, for later announcement.

The Women's Committee will hold a luncheon meeting and will be in evidence in their usual annual conference on the problems of Committee administration.

The Convention Committee is made up of the following members:

Auditing—E. N. Simmons, Los Angeles Gas and Electric Corp.

Entertainment—Clyde H. Potter, Southern Counties Gas Company

Hotels—R. R. Blackburn, Southern California Gas Company

Program—D. L. Scott, Los Angeles Gas and Electric Corp.

Program Manager—William Maddock, Los Angeles Gas and Electric Corp.

Publicity—Douglas Buckler, Southern California Gas Company

Registration—W. C. F. West, Los Angeles Gas and Electric Corp.

Sports—A. L. Spring, California Servel Incorporated

Transportation—J. B. Prewett, Los Angeles Gas and Electric Corp.

General Chairman: D. L. Scott

All the indications point to a successful convention of great interest and profit; and it is hoped that attendance will be in direct ratio to the excellence of the Convention program.

Gas Engineers' Handbook Now in Printers' Hands

THE Gas Engineers' Handbook of the Pacific Coast Gas Association, upon which an able committee of gas engineers has worked for a number of years, is now being printed and will be published by the McGraw-Hill Book Co. early in 1934.

It will be a book of some thousand pages, 9 inches by 6 inches in dimension, and will contain hundreds of tables, charts and graphs indispensable to engineers engaged in any phase of the manufactured or natural gas business.

The editorial committee whose labors are so successfully concluded was made up of the following engineers:

Frank Wills, Chairman, Engineer of Production, Pacific Gas and Electric Co.; Clifford Johnstone, Managing Director, Pacific Coast Gas Association; A. F. Bridge, Vice-President, Southern Counties Gas Co.; H. L. Masser, Vice-President, Los Angeles Gas and Electric Corporation; E. L. Hall, General Superintendent, Portland Gas and Coke Co.; William Moeller, Vice-President, Southern California Gas Co.; L. M. Klauber, Vice-President, San Diego Consolidated Gas and Electric Co.; S. H. Graf, Professor of Mechanics, Oregon State College; B. G. Williams, Measurement Engineer, Southern California Gas Co.

In addition to the above committee of the Pacific Coast Gas Association, the manuscript was thoroughly reviewed and endorsed by a committee of the American Gas Association, many of whom also have made notable contributions to its contents. The committee of the American Gas Association was as follows: J. V. Postles, assistant to vice-president, Philadelphia Gas Works Co., chairman; A. M. Beebee, general superintendent, Rochester Gas & Electric Co., Rochester, N. Y.; R. M. Conner, director, American Gas Association Laboratory, Cleveland, Ohio; J. D. Davis, chemist, Bureau of Mines, Pittsburgh, Pa.; Fred Denig, general superintendent, Koppers Construction Co., Pittsburgh, Pa.; W. M. Hepburn, vice-president, Surface Combustion Co., Toledo, Ohio; C. C. Jones, assistant engineer of distribution, Philadelphia Gas Works Co., Philadelphia, Pa.; A. F. Kunberger, chemist, United Gas Improvement Co., Philadelphia, Pa.; and

H. C. Porter, consulting engineer, Philadelphia, Pa.

The Handbook has been endorsed by the Executive Board of the American Gas Association as a notable contribution to the literature of the gas industry.

Nominating Committee Submits Report

PURSUANT to Article 3 of the By-Laws of the Pacific Coast Gas Association the undersigned members of the Nominating Committee declare that they will place the names of the following members in nomination at the annual election which will be held at the Ambassador Hotel, Los Angeles, on September 13, 1933.

For President: Geo. P. Egleston, San Francisco

For Vice-President: J. B. Wilson, Santa Cruz

For Treasurer: D. G. Martin, San Francisco

For Directors: F. M. Banks, Los Angeles; L. M. Klauber, San Diego; H. M. Crawford, San Francisco; O. L. Dickinson, Fresno

Nominating Committee:

R. E. Fisher, Chairman
W. D. Dickey
Ray Logue
Geo. L. Myers
F. J. Schafer

Appliance Groups Discuss Industrial Recovery Act

AS noted in the July issue of *Western Gas,* gas appliance manufacturers have been prompt to cooperate with the industrial recovery administration, and during the past two months have held many meetings for the purpose of applying the provisions of the Recovery Act to the appliance manufacturing business.

Pacific Coast manufacturers and distributors of gas water heaters and gas-fired central heating appliances have completed the writing of a code which a majority of them have signed. Filing of this code has been deferred pending developments nationally.

At a meeting of gas appliance manufacturers held in Cincinnati, Ohio, on July 17 and 18 there were formed several new associations through which gas appliance manufacturers hope to operate under the Industrial Recovery Act. The scope of these associations is made evident through their names, these being the Gas Range Institute, the Gas Water Heater Institute, the Gas Furnace and Boiler Institute, and the Gas Space Heater Institute. In order to correlate the work of these four institutes there was also formed a Gas Appliance Institute, of which the first four will be members. At the Cincinnati meeting a majority of gas appliance manufacturers joined one or more of these institutes and adopted by-laws and a general code of fair competition. Meetings will continue to work out the necessary details before this code can be filed. Provision has been made so that the Manufacturers' Section of the Pacific Coast Gas Association, through its several divisions, will be recognized as a regional unit in these national institutes.

Edward Campbell Jones

Edward C. Jones
1861-1933

FOR THIS COMMENTARY upon the life and influence of E. C. Jones we are indebted to W. M. Henderson, who over the past 30-year period knew Mr. Jones as few were privileged to know him.—*Editor.*

THE gas industry is what it is today because strong men have guided its development and shaped its destiny. Each in his time and each in his place wielded an influence that has left a permanent impression.

To live in the memory of our associates, with the results of our efforts a blessing to posterity, is not to die. Though we record the passing of Edward Campbell Jones—his engineering accomplishments, his dynamic personality, his faculty for organization, and his strong character will long live in memory or fact.

The end came while he slept, at his home in Palo Alto, California, on July 24, 1933. His age was 72.

There is much to be said of Mr. Jones's career that would serve as an inspiration to the youth that is now taking up the burden of the industry; as a guide to those now responsible for its progress and as pleasant memories to those who were long associated with him in the industry.

In his native city, Boston, at the age of 16, Edward C. Jones entered the employ of the South Boston Gas Co. His interest and genius in the gas utility field were inherited from a father who was an early pioneer in the development of the business in New England.

Mr. Jones made his first bid for fame when, at the age of 18, he invented and developed the Jones Jet Photometer. This device received universal acceptance as a rapid and economical method for ascertaining candle power of gas, the then only recognized measure for gas quality.

In time he occupied many responsible positions with the Boston company, until, in 1891, at the solicitation of Jos. B. Crockett, then president of the San Francisco Gas Light Co., he accepted a commission to come west to take charge of the construction of the North Beach Plant at San Francisco. From that time, until his retirement in 1920, he served as chief engineer for the Pacific Gas and Electric Co. or its predecessors, and, either directly or as a consultant, directed the development of gas properties throughout California.

The outstanding contribution to the industry on the Pacific Coast was his successful development of an apparatus and process for production of gas from crude oil, a product in great abundance and of low market value in the early years of this century. Others, as evident from the Patent files, had struggled with the problem, but all approached the solution from experience with coal-gas production. It remained for Mr. Jones to take some of the unsuccessful efforts and apparatus of those early pioneers and, with his keen analysis of the cause of failure, to produce a machine which in principle today is the standard of oil-gas production.

His early New England training and heritage was no doubt an influence on his sense of thrift and economy, which is associated with so many of his contributions to the industry. It was not his thought to make the gas business grand by building luxuriously, but to make it universally useful and acceptable by keeping the investment cost in bounds and the operating expense at a minimum, and to maintain a standard for service quality that would satisfy perfection. All his thoughts, advice and action indicated his sense of responsibility to this standard—as a duty owed to the community, that its citizens might be benefited by and enjoy the utility of gas.

His contribution to distribution practice, which insured improved service at lower costs, is a typical illustration of his constant effort to meet the obligation of the trust he held. Many of his technical achievements were original, some were applications of ideas, secured from others or used in some industrial pro-

cess, which he had the courage to reduce to practice. Such is the development of welding of gas mains, credit being due Mr. Jones for this very radical departure in pipe joining—an idea he gathered from his constant study and reading of technical processes in other fields. He also was instrumental in the development of high pressure gas distribution, the acceptance of which has made possible the wide area for gas supply.

Coming from New England, where he experienced the benefits of an organized association within the industry, he promptly took the steps which resulted in the establishing of the Pacific Coast Gas Association, and, as its founder, contributed greatly to its record and success. He had the unique honor of twice being elected to its presidency and, as a fitting tribute to his activity in its affairs, he was in 1923 elected to honorary membership in the Association. It was through his efforts, when president of the American Gas Institute in 1912, that an International Gas Congress was held in San Francisco on the occasion of the Panama Pacific Exposition. That his ability was recognized in other fields is evident by his officiating as vice-president of the American Society of Mechanical Engineers.

There is hardly a phase of the industry in which he failed to play an active part. The establishment of the chair of Gas Engineering at the University of California was due, largely, to his work in its behalf, and a series of lectures, delivered at the University, was a further contribution to its success. Another achievement to his credit was the founding of the Pacific Coast Gas Association Library, now possibly the best assembled collection of books and papers on the industry.

To his associates in various activities, to those who worked with or for him his greatest contribution was the influence of his personality. He was a courageous leader and a gifted organizer. His New England philosophy fitted well his responsibility, and was the faculty that contributed most to his success as a builder of men and their work.

His keen mind or observation always sensed the essentials in any problem. Once these were mastered, the rest was a matter of detail. No task was ever ventured unless or until the finish was visible; there was always a definite plan and destination for all his work.

He possessed little homely ways for developing the human facilities of seeing and thinking. Intelligence, to him, was a far more valuable personal asset than mere knowledge. He once observed that "the danger of knowing too much is thinking too little." Experience possessed of intelligence was his idea of balance. When the thought was advanced that education, alone, would fit a man for responsible leadership, his observation was that in only one activity was it possible to successfully start at the top, and that was "grave digging!" To develop responsibility in others he required the submission of any question with a recommendation, and discouraged those who simply sought advice on procedure without some personal application of thought. When work was to be delegated to others there was never a question as to whether one could do it, nor a direct order; but a request, with an implied impression of his faith in one's ability to do the task. There were few failures. Mistakes and errors were never publicly exposed; he realized that a man's conscience was the best disciplinarian; his methods of correction were always tempered with sympathy.

His contribution in the form of engineering work, inventions, and as a developer of men marked him as a master leader, and the honors bestowed upon him were only excelled by the great value for good that his efforts brought to his chosen field—the gas industry.

The Addison B. Day Medal of Honor

AN announcement has been sent to all Association members soliciting nominations for the award of the Medal of Honor which the Association is privileged to award each year because of the generosity of our Past President Addison B. Day, president of the Los Angeles Gas and Electric Corp.

Mr. Day's purpose in initiating this award was to provide some means of giving fitting recognition to those men and women in the industry who carry the torch which lights the industry's way into new fields of glory and service, and upon whose labor and imagination the progress of the industry depends. Every member of the Association is privileged to suggest the name of that man or woman whom he believes most deserving of receiving the 1933 medal. Nominations should be sent direct to President H. L. Masser, vice-president and executive engineer of the Los Angeles Gas and Electric Corp., Los Angeles, Calif.

The 1932 Medal of Honor was awarded to Frank Wills, engineer of production of the Pacific Gas and Electric Co., for his research and study on gas burner design and design of flues and chimneys; also for his work as chairman of the Association's committee in charge of the writing of the Gas Engineers' Handbook.

Death of J. Chas. Jordan Loss to Industry

WORD of the death on July 16 of J. Charles Jordan, widely known throughout the western utility industry for his service in the advertising and publicity field, was a shock to his many friends and associates. He died suddenly at an Oakland hospital following an operation, after having appeared to be regaining his strength.

J. Charles Jordan

Mr. Jordan was a dean among utility advertising men, and a veteran on the Pacific Gas and Electric Co. staff. Born in Oakland in 1888, he first took employ with the P. G. and E. in 1905 at the Oakland office. He was transferred to San Francisco about 12 years ago, when he played a leading part in the organization of the company's advertising and publicity department with which he has since served.

In addition to his work with the P. G. and E. organization, he was identified closely with the activities of the Pacific Coast Gas Association for a number of years. He was a member of the Association's first Cooperative Advertising Committee formed in the year 1929, and at the time of his death was chairman of the present committee. He also was active in the work of the Pacific Coast Electrical Association, as well as civic groups in Northern California.

1933 Calendar

September

Pacific Coast Gas Association—Annual Convention, Ambassador Hotel, Los Angeles, Calif., Sept. 13-15, 1933.

Canadian Gas Association—Annual Convention, Ottawa, Can., Sept. 18-19, 1933.

American Gas Association—15th Annual Convention and International Gas Conference, Chicago, Ill., week of Sept. 25, 1933.

Natural Gas Department, A.G.A.—Annual meeting, Chicago, Ill., Sept. 25, 1933.

October

American Petroleum Institute—14th Annual Meeting, Chicago, Ill., Oct. 24-26, 1933.

Here and There With Western Gas

A SUMMER field trip now under way is taking Craig Espy, vice-president of *Western Gas,* into highways and byways of gas service in a score or more states from east to west coasts. This page for the next several months will share some of the contacts of this trip with our readers—through photographs of personalities and operating facilities in the *Western Gas* editorial service area.

In the group of photographs at the right we see:

1. Partial view of manufacturing plant of Central Indiana Gas Co., Muncie, Indiana.

2. W. M. Henderson, superintendent of gas distribution for Los Angeles Gas and Electric Corp., standing in front of a test rack of 150 domestic meters at the Channing Street distribution headquarters of his company.

3. E. J. Britsch, manager of the Peoples Service Co. at Connersville, Indiana.

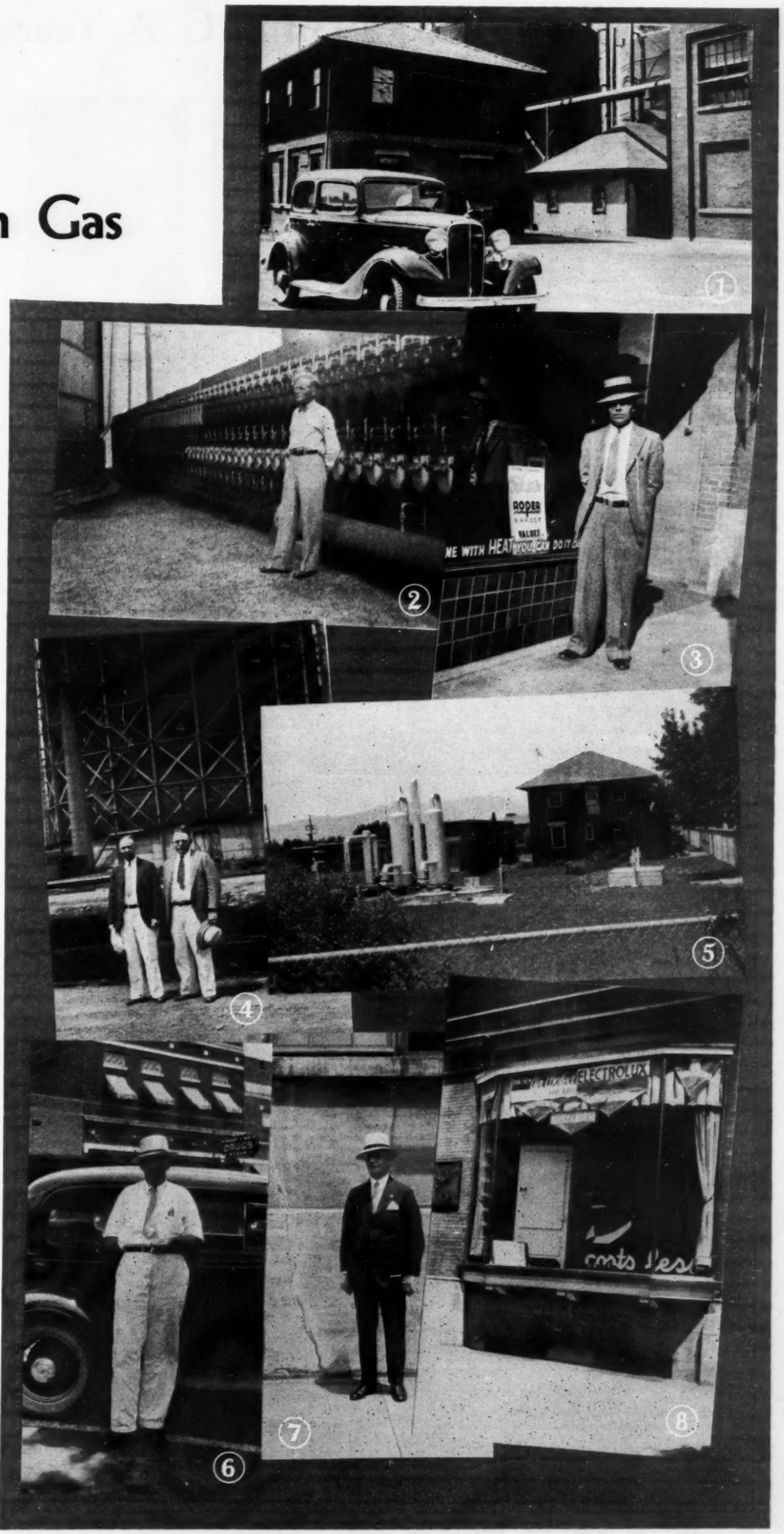
4. Two of Louisville Gas and Electric Co.'s operating staff—Charles DeWeese (left) assistant superintendent, and J. W. Sullivan, general foreman.

5. Headquarters of El Paso Natural Gas Co., a few miles out of El Paso, Texas. El Paso Natural supplies gas through its line from New Mexico fields to Texas Cities Gas Co. for distribution in El Paso, and also to Western Gas Co., which serves southeastern Arizona and northern Mexico mining centers, and plans now to extend its line to Phoenix.

6. H. H. Walker, Indiana-Kentucky Natural Gas Corp., Owensboro, Kentucky,—formerly associated with Community Natural Gas Co. of Dallas Texas, and Utah Gas & Coke Co., Salt Lake City, Utah.

7. Colonel M. W. Walsh, superintendent of Louisville Gas and Electric Co., Louisville, Kentucky.

8. The Wheeling office of Natural Gas Company of West Virginia carries this current window display on the air-cooled Electrolux gas refrigerator.



A few gas men and gas headquarters, as the 'Western Gas' camera caught them during the past month.

Nominations for 1933-1934 A. G. A. Year

ANNOUNCEMENT has been made by the General Nominating Committee of the American Gas Association of its selection of officers to serve for the coming Association year. The committee suggests the following:

For president—H. O. Caster, member of the executive committee of Henry L. Doherty & Co., New York, N.Y.

For vice-president—P. S. Young, vice-president, Public Service Electric and Gas Co., Newark, N.J.

For treasurer—William J. Welsh, president, New York and Richmond Gas Co., Staten Island, N. Y.

For Directors: H. C. Abell, president, National Power & Light Co., New Orleans, La.; Walter C. Beckjord, vice-president and general manager, Boston Consolidated Gas Co., Boston, Mass.; Howard Bruce, chairman of the board, Bartlett Hayward Co., Baltimore, Md.; J. S. De Hart, Jr., president, Isbell-Porter Co., Newark, N.J.; F. C. Freeman, president, Providence Gas Co., Providence, R.I.; R. W. Gallagher, president, The East Ohio Gas Co., Cleveland, Ohio; C. N. Lauer, president, Philadelphia Gas Works Co., Philadelphia, Pa.; B. J. Mullaney, vice-president, Peoples Gas Light & Coke Co., Chicago, Ill.; Herman Russell, president, Rochester Gas and Electric Corp., Rochester, N.Y.

The General Norminating Committee is composed of Ernest R. Acker, chairman, E. E. Eysenbach, A. B. Macbeth, W. Frank Roberts, W. A. Sauer, and R. G. Soper.

The following nominations for section chairmen were made by the respective Section nominating committees:

Natural Gas Department: For chairman—Frank L. Chase, vice-president, Lone Star Gas Co., Dallas, Texas; for vice-chairman—John B. Tonkin, vice-president and general manager, The Peoples Natural Gas Co., Pittsburgh, Pa.

Accounting Section: For chairman—E. B. Nutt, Hope Natural Gas Co., Pittsburgh, Pa.; for vice-chairman—A. S. Corson, general auditor, The United Gas Improvement Co., Philadelphia, Pa.

H. O. Caster

Frank L. Chase

Commercial Section: For chairman—N. T. Sellman, director, sales and utilization, Consolidated Gas Co. of N. Y., New York City; for vice-chairman—F. M. Rosenkrans, new business manager, The Gas Service Co., Kansas City, Mo.

Industrial Gas Section: For chairman—F. B. Jones, director, industrial gas sales, Equitable Gas Co., Pittsburgh, Pa.; for vice-chairman—J. F. Quinn, supervisor, industrial sales engineer, Brooklyn Union Gas Co., Brooklyn, N.Y.

Manufacturers Section: For chairman—John A. Fry, vice-president and secretary, Detroit-Michigan Stove Co., Detroit, Mich.; for vice-chairman, appliance division — J. Scott Fowler, president, The Lovekin Water Heater Co., Philadelphia, Pa.; for vice-chairman, apparatus division — Merrill N. Davis, vice-president, S. R. Dresser Mfg. Co., Bradford, Pa.

Publicity and Advertising Section: For chairman — Henry Obermeyer, assistant to vice-president, Consolidated Gas Co. of N. Y., New York, N.Y.; for vice-chairman—John F. Weedon, superintendent of advertising, The Peoples Gas Light & Coke Co., Chicago, Ill.

Technical Section: For chairman—O. S. Hagerman, engineer, American Light & Traction Co., Chicago, Ill.; for vice-chairman—C. A. Harrison, gas engineer, H. L. Doherty & Co., New York City.

Gas Sales Reflect Improved Conditions

GAS SERVICE CO., Kansas City, Mo., closed its range campaign the last week in June with a total of 1,183 ranges sold in the six weeks period, 494 of which were sold during the last 10 days of the campaign, conducted under the direction of F. M. Rosenkrans, new business manager for the Gas Service group.

The record made reflects to a large degree the noticeable upturn in general business coditions, as well as the hard work which the individual salesmen put into the specialized sales effort.

Joplin Gas Co., Joplin, Mo., under the direction of W. E. Carden, made the most remarkable record, with 108 ranges sold. For three salesmen this is an average of 36 ranges per man for the six weeks period.

The Western Distributing Co. at El Dorado, Kan., with Walter Cray in charge, jumped from third to second place during the last 10 days of the campaign with a total of 50 ranges. The sales were evenly divided between Mr. Cray and Paul Cruit, salesman for the property, each totaling 25 ranges.

The Warrensburg, Mo., group brought in results which gave it third place in the campaign, with 24 ranges sold.

Capital Gas & Electric Co., Topeka, Kan., won fourth place, Lou Rosele, manager of the new business department, reporting total sales of 167 ranges.

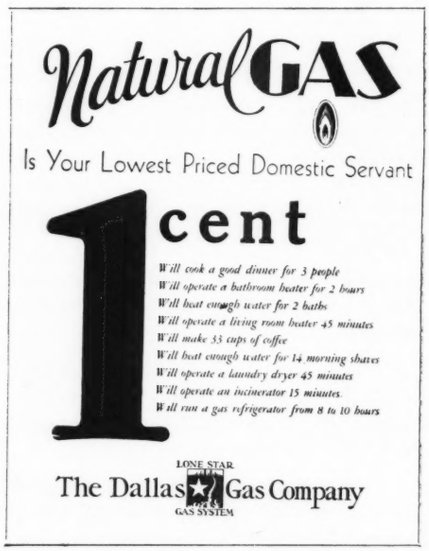
Arkansas Valley Gas Co., Arkansas City, Kan., reported sales totaling 47 ranges, 20 of which were sold during the last 10 days of intensified effort, under the direction of J. G. Mawson, manager for the company there.

Kansas City Gas Co., Kansas City, Mo., under the direction of M. B. Buckley, sold 262 ranges, 112 during the last 10 days of the campaign, and other Gas Service properties brought in unusually good records which took the total range sales to a new high, with 16 salesmen from the various properties selling 25 or more ranges during the period.

Lone Star Gas Co. Places First in Better Copy Contest

AS A special feature of the annual meeting of the Public Utilities Advertising Association held late in June at Grand Rapids, Mich., announcement was made of winners in the Association's Better Copy Contest, by F. W. Krone, Consolidated Gas Co., New York, as chairman of the committee.

Lone Star Gas Co., Dallas, Texas, was awarded first prize in the Gas Newspaper Advertising Division with the copy shown in the accompanying illustration. The prize-winning copy was prepared by Willard G. Wiegel, assistant advertising manager of the company. W. C. Grant is advertising manager of the Lone Star System.


Natural GAS
Is Your Lowest Priced Domestic Servant
1 cent
Will cook a good dinner for 3 people
Will operate a bathroom heater for 2 hours
Will heat enough water for 2 baths
Will operate a living room heater 45 minutes
Will make 53 cups of coffee
Will heat enough water for 14 morning shaves
Will operate a laundry dryer 45 minutes
Will operate an incinerator 15 minutes
Will run a gas refrigerator from 8 to 10 hours
The Dallas Gas Company
LONE STAR GAS SYSTEM

Second prize in the division was awarded to Consolidated Gas Co. of New York and honorable mention to Pittsfield Gas Co., Pittsfield, Mass. Other division prizes were awarded as follows:

Gas Window Display Division: first, Kings County Lighting Co., Brooklyn; second, Consolidated Gas Co. of New York; honorable mention, Central Hudson Gas & Electric Corp., Poughkeepsie, N.Y.

General Utility Advertising Division: first, Arkansas Power and Light Co., Pine Bluff; second, British Columbia Electric Railway Co., Ltd., Vancouver; honorable mention, New Orleans Public Service Inc., New Orleans.

COMMITTEE:
DOUGLAS BUCKLER . SO. CALIF. GAS CO.
J. EARL JONES . . . SEATTLE GAS CO.
F. U. NAYLOR . . . . . P. G. & E.
D. L. SCOTT . . . . L. A. G. & E. CO.

HEADQUARTERS:
PACIFIC COAST GAS ASSOCIATION
447 SUTTER STREET SAN FRANCISCO
H. L. MASSER (L. A. G. & E. CO.) PRESIDENT
CLIFFORD JOHNSTONE, MNG. DIRECTOR

P. C. G. A. NEWS

ORGANIZED PACIFIC COAST GAS ASSOCIATION JULY 11TH 1893

CO-OPERATIVE ADVERTISING

AUGUST ADVERTISING SCHEDULE

August finds this Coastwide advertising program (devoted to the service of the entire gas industry of the Pacific West) in the eighth month of its fifth year.

The following publications will carry full page or 2/3-page insertions this month:

Miscellaneous Industries: Western Baker; Western Confectioner & Ice Cream News; Pacific Dairy Review; Pacific Factory; Pacific Laundry Journal & Dry Cleaner; Western Machinery & Steel.

Appliance Dealers: Western Appliance Retailing; Western Plumbing & Heating Journal.

Architects, Builders: Architect & Engineer; California Arts & Architecture; Pacific Builder & Engineer; Southwest Builder & Contractor.

Hotels, Restaurants: Hotel News of the West; Pacific Coast Record; Pacific Coast Chef; Western Hotel Reporter; Western Restaurant.

36 MILLION "IMPRESSIONS"

The complete coverage of the campaign is indicated by the following figures:

Total combined circulation, 19 publications	70,000
Estimated number readers (circulation x 3)	210,000
Total number insertions	175
Total "impressions" (readers x insertions)	36,750,000
Cost per reader	$ 00.095
Cost per impression	$00.00045

NEW ADVERTISEMENTS

TOP—"Bakes a Better Loaf of Bread at Lower Cost" tells the whole story of gas fuel in Hansen's Bakery, Seattle.

BOTTOM—"Where Purity is Paramount," as in Triangle Candy Co.'s Los Angeles factory, gas leads other fuels by a wide margin!

ARTICLES PUBLISHED DURING JUNE

Results obtained by our Technical News Service continue to mount month by month. As reported in July "Western Gas," a total of 56 articles had appeared during the first five months of 1933. 10 more were published during June, making the half-year record 66:

KEELER'S PACIFIC HOTEL REVIEW—**Famed San Diego Cafe Uses Gas for Fuel with Great Economy**—Gas-fired cooking equipment in Ye Golden Lion Tavern, well-known San Diego restaurant.

WESTERN HOTEL REPORTER—**Chicken Inn Traffic Grows Despite Times**—Gas-fired cooking equipment in Coon Chicken Inn, highly successful Seattle road-house.

PACIFIC COAST CHEF—**Cake Baking Course**—Gas-fired baking equipment in use for instruction purposes at General Mills, Inc., Cake School, held in San Francisco from June 5 to 14.

WESTERN RESTAURANT—**Open Kitchen Makes Money on 15 Cent Meals**—Gas-fired cooking equipment at Open Kitchen Restaurant, Seattle restaurant specializing in low-priced quality food. (2) **What About Lucca's Success? Here's the Answer**—Gas-fired cooking equipment in new Los Angeles Lucca's restaurant.

WESTERN PLUMBING & HEATING JOURNAL—**O'Keefe & Merritt Launch New Water Heater**—New gas water heater recently placed on the market.

WESTERN MACHINERY & STEEL WORLD—**Furnace and Shop Work on Transport Planes**—Gas-fired heat treating as an important part of production of new all metal transport planes at Boeing Company's plant, Seattle. (2) **The Manufacture of Automobile Axles**—Gas heat treating effects large savings and increased efficiency in plant of Edwin L. Stanton, Inc., Los Angeles.

PACIFIC FACTORY—**Interesting Process in Broom Making Plant in Northwest**—Efficient and economical gas-fired drying equipment used in plant of Hanset Bros., Portland, Ore.

ARCHITECT & ENGINEER—**Heating and Air-Conditioning Plants in the Huntington Library**—Gas heating and conditioning equipment meets particular atmospheric requirements of famous library.

BUTANE • PROPANE NEWS

Vol. 3, No. 8 August, 1933

The A. G. A. Laboratory Program for Appliances Using Butane-Propane

By F. R. WRIGHT
Publications Editor
A.G.A. Testing Laboratory

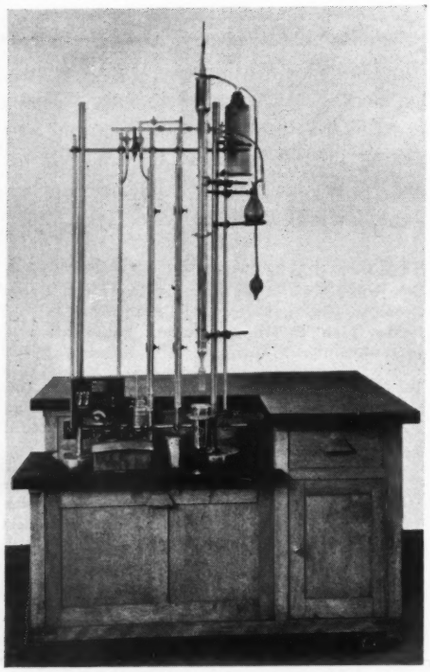


Fig. 1. Modified Podbielniak low temperature fractionation apparatus for analysis of liquefied petroleum gases.

A REVIEW of the trends of fuel industries during the past few years reveals some interesting and significant facts concerning the development of liquefied petroleum gas service. Statistics show that the market output of liquefied petroleum gases in 1932 was 33 times as great as it was in 1927. Within the past few years butane-air mixing as been made a commercial reality with umerous butane-air plants constructed in arious sections of the United States bring- ng gas service to hundreds of communities unable to afford manufactured or natural gas systems. In small isolated communities and rural sections bottled gases, which are largely propane marketed under various trade names, have been made available, giving the residents of such districts gas service comparable with that enjoyed by urban communities. Domestic gas ranges, space heaters, water heaters, and many of the other common types of gas-burning equipment have been developed for use with propane and butane-air gases. So rapid has been the expansion of the liquefied petroleum gas industry that, at the end of 1932, 134 separate communities in 28 states were being served with propane and/or butane-air piped to their peremises from central stations. Three communities in Canada, Three Rivers, Quebec, and Milltown and St. Stephen, New Brunswick, were also being supplied with butane-air gas at the end of last year.

In order to utilize butane-air and propane gases satisfactorily, appliances designed for use with ordinary manufactured and natural gas supplies, must be modified slightly, particularly with respect to types and sizes of orifices, injection tubes, and sizes of burner parts. Some manufacturers have, therefore, designed extra burners for use in their regular line of appliances in order to convert them over to utilize propane and butane-air gases. Due to the relatively short flame secured with propane gas the burners of an appliance are usually set up higher and nearer to the surface to be heated. In other words, less head room for the flames, or space between the burner ports and the heating surface, is needed in order to effect complete combustion with propane due to the shorter flame characteristics. Many manufacturers have designed appliances especially for use with propane gas and with butane-air.

Laboratory Study Begun

Being cognizant of the developments taking place largely in the petroleum industry, the American Gas Association Testing Laboratory undertook in 1929 an investigation having for its aim the development of equitable national standards for the construction and performance of gas appliances for use with propane and butane-air gases. This research, although first concerned with the development of approval requirements for gas ranges designed to utilize these gases, was later also extended to cover space heaters and water heaters. Extensive studies of the characteristics of various butane-air mixtures were also made in conjunction with the Laboratory's general research on mixed gases.

These investigations involved many considerations including: (1) surveys from different viewpoints of existing propane and butane production, distribution and utilization; (2) exhaustive reviews of literature relating to the chemical and physical properties and combustion characteristics of liquefied petroleum gases as well as butane-air mixtures augmented by investigations yielding new and heretofore unavailable information of this nature, and (3) extensive test work to determine the effects of heating value and gas pressure variations, heat input ratings, and conditions of gas appliance adjustments, on the performance of all common types of domestic gas appliances.

The results of these studies and investigations made possible the development of A.G.A. approval standards for gas ranges designed to utilize propane gas and butane-air gas. These standards were completed by the American Gas Association and approved by the American Standards Association in 1932. Similar codes regulating the construction and performance of hot plates and laundry stoves, space heaters, and water heaters were recently completed by the American Gas Association and submitted to the American Standards Association for adoption as American Standards.

It is the purpose of this paper to explain the A.G.A. Laboratory's testing program in connection with the above mentioned approval requirements for appliances, using butane-air and propane gases with particular reference to the reasons for choosing the test gases and normal test pressures employed and the manner of obtaining appropriate gas supplies.

Specifying Test Gases

At the outset it was apparent that the existing construction and performance requirements for gas appliances used with natural and manufactured gas did not need to be radically changed to be made to satisfactorily apply to appliances used with propane and butane-air supplies. To be sure, it was necessary to require that fixed orifice (or hoods) only be used with propane gas and that appliances be properly marked with reference to the approval gas, but in general the only necessary changes concerned the test gas. Consequently, the testing procedure for butane-air and propane gas appliances is substantially the same as the familiar procedure customarily followed in studying ordinary natural and manufactured gas appliances. Hence, this discussion need concern itself only with the selection and procuring of test gas supplies.

In specifying the test gases many items merited consideration. It was desirable to so stipulate the composition and normal pressure of both the test propane and butane-air supplies that (1) average conditions existing in practice were closely simulated, (2) butane-air mixtures were beyond explosive limits, (3) both test fuels were of compositions reasonably immune from changes in heating value as a result of condensation during transmission, and (4) the effect of the test fuels on appliance performance was as severe as consistent with the above three specifications.

Consequently, as a first step a survey was made of the butane-air mixtures used in various localities throughout the country and of the pressures at which butane-air and propane gases are supplied in practice. It was found that butane is usually diluted with air until mixtures of heating values varying from 520 to 600 B.t.u. per cubic foot are obtained, and that these mixtures are supplied at many pressures, although rarely in excess of 5 inches of water. Different propane supplies, on the other hand, are somewhat more consistent, heating values being generally near 2,500 B.t.u. per cubic foot despite the fact that occasionally sizable quantities of propylene and butane are present in supplies. Propane is usually employed at considerably higher pressures (10 to 11.5 inches of water) than other gases.

Extensive studies were made by the A.G.A. Laboratory to determine the effects upon appliance performance of variations in the compositions and pressures of propane and butane-air fuel supplies. Since, in the case of butane-air fuels, a part of the air required for complete combustion is already mixed with butane before it reaches the appliance and since 1 cubic foot of the usual mixture contains only one-sixth of a cubic foot of butane, comparatively little air need be inspirated as primary air at the appliance. Thus the greatest problem in butane-air utilization is the prevention of lifting flames due to over-aeration, and the most sensitive butane-air supplies are those containing the most air in the supply mixture (i.e. possessing the lowest heating values) and those furnished at the highest pressures (i.e. possessing the greatest primary air-injecting powers). With propane gas the matter is entirely reversed, for a great deal of air is required for complete combustion and none

CYLINDERS
FOR
BOTTLED GAS

Properly Designed in Accordance with I.C.C. Regulations — Rigidly Inspected — Thoroughly Tested.

The majority of distributors of Liquefied Petroleum Gas now use Scaife Cylinders.

Modern Manufacturing Methods combined with an increasing demand have resulted in Scaife I.C.C. Cylinders being the most economical cylinder in use today.

Cylinders built to meet each purchaser's service requirements.

A large stock of cylinders of standard sizes insures prompt service. 130 years of experience in manufacture of steel products is behind each Scaife cylinder.

FOUNDED 1802

WM. B. SCAIFE & SONS CO.

Oakmont, Pa. (Pittsburgh District)

New York Pittsburgh Chicago

GROBLE REGULATORS & GOVERNORS

Complete Line of Regulators for

Natural, Manufactured, Butane and Propane Gas

Pacific Coast Representative,

T. G. ARROWSMITH COMPANY,

661 Howard Street San Francisco, Calif.

Phone Garfield 8419

GROBLE GAS REGULATOR COMPANY

Office and Factory: Anderson, Indiana

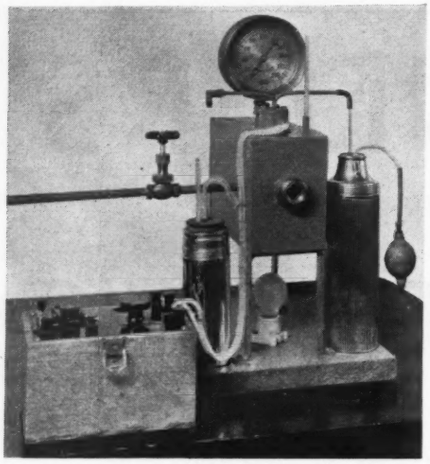
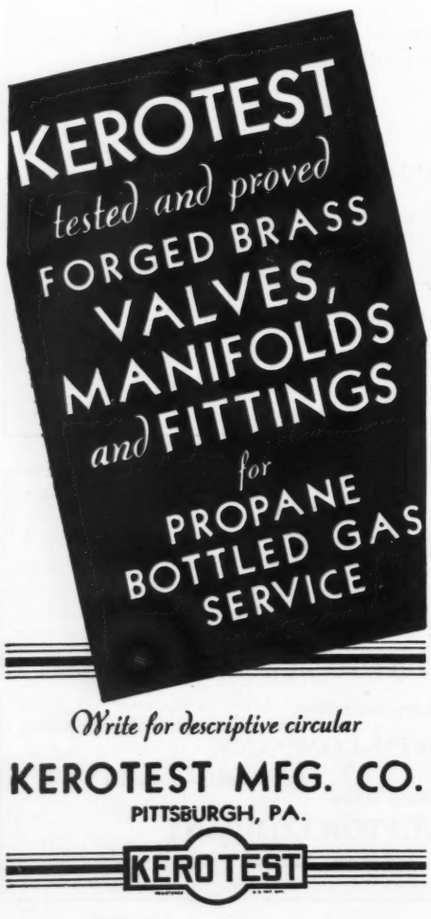


Fig. 2. Special dew point apparatus developed by A.G.A. Testing Laboratory.

is mixed in the gas supply; therefore, high inspirating effects are needed and low pressures represent the severest condition.

Therefore, to select butane-air and propane test gases which would represent practical conditions and at the same time insure safe and satisfactory operation of approved appliances with any other reasonable butane-air or propane supplies, the following requirements were adopted for the liquefied petroleum test gases to be used in A.G.A. approval testing.



Write for descriptive circular

KEROTEST MFG. CO.
PITTSBURGH, PA.

KEROTEST

(1) Butane-air—525 B.t.u. per cubic foot, 1.16 specific gravity, 5 inches equivalent water column normal pressure, tests to be made at 0.5 normal, normal, and 1.25 normal pressures.

(2) Propane—approximately 2,500 B.t.u. per cubic foot, 1.55 specific gravity, 11 inches equivalent water column normal pressure, tests to be made at 8 inches, 11 inches, and 13 inches equivalent water column pressures. Propane gas selected for appliance testing is required to have at least 95 per cent propane and/or propylene with the propylene content limited to 35 per cent of the propane content. Ethane and/or butane in the test gas is limited to not more than 5 per cent.

Fig. 1 shows a view of a modified Podbielniak Low Temperature Fractionation Apparatus used by the A.G.A. Laboratory for the analysis of liquefied petroleum gases.

These two fuel gases, of course, are not explosive. As a matter of fact, the above mixture of butane and air contains less than one-half the amount of air required to produce an explosive mixture. Furthermore, the 525 B.t.u. per cubic foot mixture is less susceptible to changes in heating value, due to butane condensation during transmission, than most commercial butane-air supplies. This fact was verified by tests conducted with many different butane-air mixtures on a special Dew Point Apparatus developed at the A.G.A. Laboratory. A photographic view and cross-sectional drawing of this apparatus are shown in Figs. 2 and 3, respectively. With it studies of the dew points (the temperatures at which butane condensation occurs) were made with dry butane-air mixtures of various heating values at pressures of from 0 to 100 pounds per square inch. In no case was it found possible to condense butane out of the 525 B.t.u. per hour butane-air mixture at temperatures above the freezing point of water with pressures below 90 pounds per square inch.

The two test gases mentioned have proven to be quite satisfactory from all standpoints, and appliances which are tested and approved with them should perform safely in any section of the country when properly installed and adjusted on the type of gas for which they were supplied.

Butane-Air Mixing at Laboratory

In order to carry out routine testing of appliances designed to utilize propane and butane-air, it was necessary for the A.G.A. Laboratory to arrange to secure adequate supplies of these two test gases. It was found that propane could easily be secured in cylinders and, by means of appropriate valves, regulators and connections supplied to appliances as desired. To supply butane-air in sufficient quantity, however, was considerably more difficult.

In conducting the initial researches with butane-air, manually operated equipment for mixing the butane and air was employed, with one of the 5,000 cubic feet test gas holders being used for storage purposes. Upon completion of the requirements for butane-air appliances, however, it became apparent that an automatic butane-air mixing plant would be required in order to carry out routine testing. Therefore, in 1932, steps were taken to install such equipment. A survey of the commercial plants on the market disclosed that they were all too large for the Laboratory's needs, a maximum capacity of 1,000 cubic feet per hour being all that was required. Although there was no precedent to follow, Laboratory engineers were of the opinion that a successful installation could be made using small automatic equipment designed for other purposes but adaptable for use in gasifying butane and mixing it with air in the proportions desired. Consequently, work proceeded on this basis. As a result, the Laboratory has in use what is believed to be one of the smallest completely automatic butane-air mixing plants in existence. It is here shown schematically in Fig. 4. It is extremely simple in con-

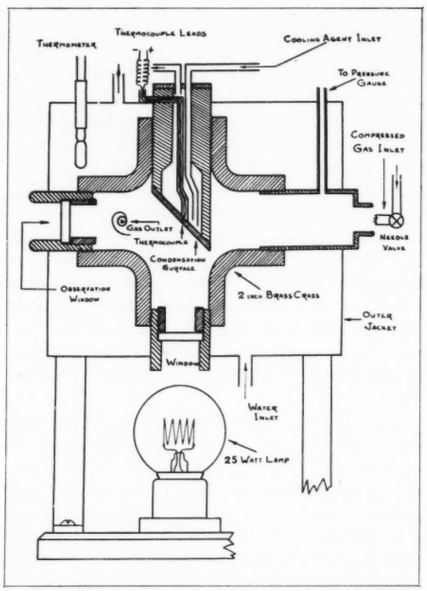


Fig. 3. Cross-sectional drawing of special apparatus for determination of dew points.

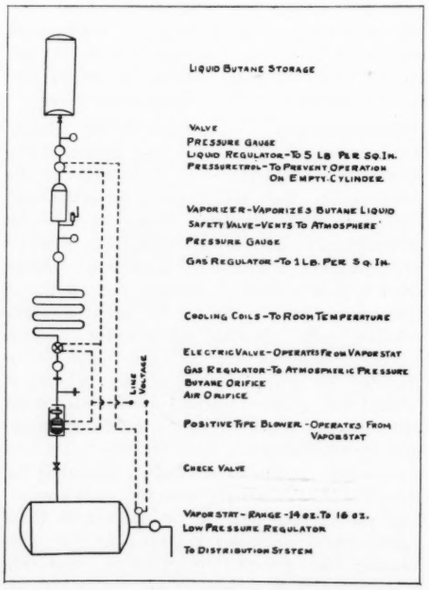


Fig. 4. Schematic diagram of butane-air plant at A.G.A. Testing Laboratory.

struction and operation, and embodies safety features which prevent the storage of explosive mixtures within the system in case the butane supply is exhausted. Its capacity is approximately 1,000 cubic feet per hour.

Design of Mixing Plant

The general arrangement and operation of the equipment is as follows:

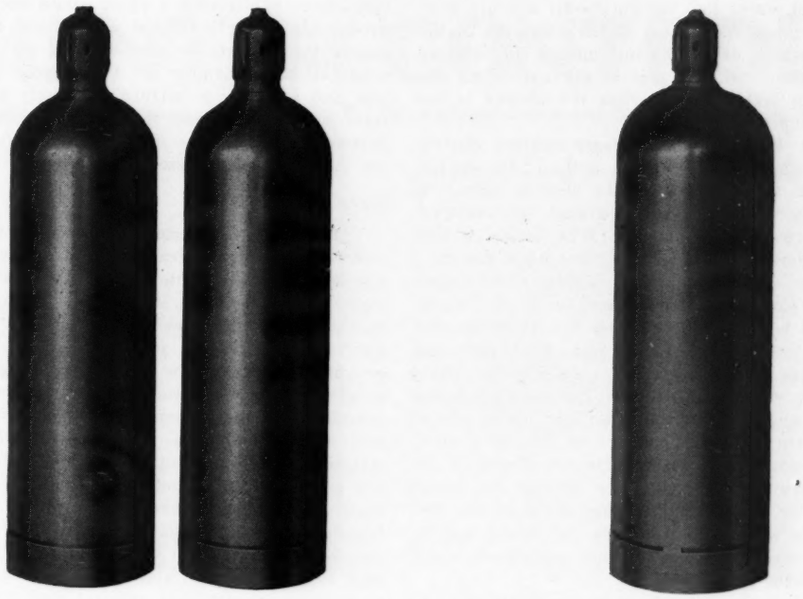
The liquid butane is stored in the small pressure tanks in which it is received. Two of these are mounted on a rack and the butane drawn off at the bottom in liquid form. Suitable valve and union assemblies are provided so that one tank may be replaced at a time without interrupting plant operation. Just beyond these connections an indicating pressure gauge is inserted in the line so that the pressure in the butane storage tank may be determined at any time. The liquid butane then passes through a high grade liquid pressure regulator which reduces the pressure of the butane liquid supplied to the vaporizer to 5 pounds per square inch. Between this regulator and the vaporizer is inserted a Pressuretrol by means of which automatic device, the electric circuit to both the blower and electric gas valve further ahead in the butane line is broken if ever the pressure of liquid butane entering the vaporizer falls below 5 pounds per square inch. Thus, the plant would automatically shut down completely if the supply of butane became exhausted or if the liquid regulator failed to function properly. This switch must be reset by hand before the blower will again start or the butane gas line open to the butane orifice, even though the liquid pressure for some reason returns to normal.

From this emergency control the liquid butane, now at 5 pounds pressure, passes into the coils, a heat exchanger or vaporizer, and is sufficiently heated (by steam in winter and by hot water in summer) to raise the temperature above the boiling point of butane at 5 pounds per square inch pressure and convert the liquid to a gas. A pressure relief valve installed near the outlet of the vaporizer prevents the pressure of the gaseous butane from building up above a limit slightly over 5 pounds per square inch.

The gas pressure is next reduced to 1 pound per square inch and the gas passed through a system of cooling coils where the temperature is equalized with that of the air later to be mixed with butane. The electric gas valve, which closes, as explained above, when butane storage cylinders approach the point of exhaustion, is located in the system following the cooling coils. The gas next passes through a second gas pressure regulator (or zero governor) which reduces the pressure to atmospheric.

At a point in the line just beyond this last regulator a carefully designed orifice plate is installed. A second orifice plate for controlling the quantity of air admitted to the system is installed in a branch line which enters the gas line through an ordinary pipe tee. The sizes of these two orifices definitely determine the proportions of air and butane gas which will be mixed.

The positive type motor-driven blower, indicated in place in Fig. 4 sets up a partial vacuum at the discharge side of both orifices and draws through them definite relative amounts of air and butane gas. The discharge of this blower passes through a



2 to 1

Of All Liquefied Petroleum Gas Cylinders in Service
—Two to One Are Hackney Cylinders

Hackney has *twice* as many liquefied petroleum gas cylinders in service today as all other makes combined.

Hackney has designed and built cylinders for over 25 years—has built cylinders for Butane, Propane and Propane-Butane mixtures from the first.

Hackney customers include the leaders—Standard Oil, Shell, Skelly, Union, Phillips, etc.

Hackney offers skilled engineering service to all users of liquid fuel cylinders.

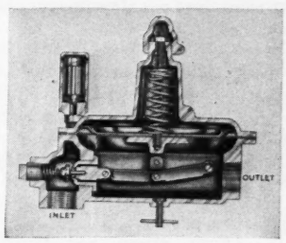
This is why Hackney is Headquarters for Liquefied Gas Cylinders

PRESSED STEEL TANK COMPANY

208 S. La Salle St. Bldg., Room 1185, Chicago, Ill.
6633 Greenfield Avenue, Milwaukee, Wisc.
1363 Vanderbilt Concourse Bldg., New York, N. Y.
666 Roosevelt Bldg., Los Angeles, Calif.

Hackney
MILWAUKEE

CONTAINERS FOR GASES, LIQUIDS AND SOLIDS



REYNOLDS
GAS CONTROL SINCE 1892

Reynolds Products—

Products for all kinds of Pressure Reduction—for either artifiicial or natural gas.

GOVERNORS—Intermediate Pressure, Triple Outlet, Holder, Toggle Type Street.

REGULATORS—High Pressure Service, Low Pressure Service, High Pressure Line, Single and Double District Station.

VALVE—Automatic Quick-Closing Anti-Vacuum, Relief, Cut-off. Model 30: manufactured for vertical or horizontal connections.

Seals: mercury and dead weight

Reynolds Gas Regulator Co.

Anderson, Indiana
422 Dwight Building—Kansas City, Missouri
Second Unit Santa Fe Building—Dallas, Texas

check valve into the butane-air mixture storage tank. Inasmuch as the operation of the blower is ordinarily intermittent the function of the check valve is to prevent mixed gas from leaking back when the blower is not in operation.

A Vaporstat, or pressure-actuated electric switch, is installed at the outlet of the storage tank and inserted in the electric circuit to both the electrically-operated gas shut-off valve and the blower. The limits on this Vaporstat are so adjusted that when the pressure in the storage tank recedes to 14 ounces the electric valve opens and the blower starts, and when the pressure rises to 16 ounces the Vaporstat automatically stops the blower and closes the electric valve. To eliminate pressure variations in the test gas supply between 14 and 16 ounces and deliver butane-air at a truly constant pressure to the distribution system, a pressure regulator is placed in the mixture supply line just beyond the outlet of the storage tank. From this point the distribution system conducts the mixed gas to the various testing stations in the Laboratory building.

This plant has been in use at the A.G.A. Laboratory for approximately a year and has proved to be entirely safe and dependable in operation. While such a plant would not be practicable in an industrial installation, this system is adequate to take care of all the needs of the Laboratory for a butane-air test gas, and produces a mixture sufficiently uniform in heating value, specific gravity, and pressure, to satisfy the strict requirements of the American Gas Association.

Scope of Test Work

The A.G.A. Laboratory in Cleveland is now in a position to carry out any type of appliance testing with two representative liquefied petroleum gases, propane and butane-air in addition to the various natural and manufactured gas supplies. A.G.A. approval requirements for gas ranges designed to utilize butane-air and propane gases were completed by the American Gas Association and approved by the American Standards Association as American Recommended Practice early in 1932. Similar requirements for water heaters, space heaters, hot plates and laundry stoves, and gas refrigerators have also been prepared. It is planned to eventually amplify all our approval requirements to embrace standards of approval for appliances designed to utilize liquefied petroleum gases.

Liquefied Gas From Petroleum Refineries

"LIQUEFIED Gas from Petroleum Refineries" was the title of a discussion by George A. Burrell and Nelson C. Turner of Burrell-Mase Engineering Co., Pittsburgh, Pa., published in the Butane-Propane News Department of *Western Gas* for July, 1933, pages 19-20. The latter portion of the paper, dealing with economic factors governing the quantity of propane which may be recovered from refinery vapors, was inaccurately reproduced. This section is republished in full below:

One of the main problems which confronts the refiner is the determination of the quantity of propane which can be economically removed from the refinery vapors. In any refinery vapor recovery plant there is a certain quantity of propane (and propylene) which is inevitably removed along with the heavier hydrocarbons and is thus an unavoidable by-product. Under ordinary operating conditions, when over 98 per cent of the pentane and heavier is removed from the vapors, approximately 30 per cent of the butane is removed and less than 10 per cent of the propane.

Mathematically the percentage of any hydrocarbon removed from the gas may be expressed in the following formula:

$$E = 376 \frac{R\ II\ W}{P\ V\ M_o}$$

Where

R = Gallons of absorption oil circulated through the absorber per unit time.

II = Absorber pressure in pounds per square inch abs.

W = Density of oil in lbs. per gallon.

P = Vapor pressure of the hydrocarbon under consideration at the absorber temperature in lbs. per square inch abs.

V = Volume of vapor passing through the absorber in unit time in cubic feet.

M_o = Average molecular weight of the absorption oil.

E = Per cent of hydrocarbon removed from the vapor by the absorption oil.

Thus it will be seen that over 10 times as great an oil rate is required to remove essentially all of the propane as is required to remove essentially all of the pentane and heavier.

Let us assume a specific case. Take for example a million cubic feet per day of a typical refinery gas of the following analysis:

Methane	33	per cent
Ethane and ethylene	29	per cent
Propane and propylene	21.3	per cent
Butane and butylene	8.2	per cent
Pentane and heavier	8.5	per cent
	100.00	per cent

For 1,000,000 cubic feet per day this would amount to a total of

$\frac{1{,}000{,}000 \times .213}{38.2}$ = 5,580 gallons per day of propane.

$\frac{1{,}000{,}000 \times .082}{32.5}$ = 2,520 gallons per day of butane.

$\frac{1{,}000{,}000 \times .085}{25}$ = 3,400 gallons per day of pentane and heavier.

In removing essentially all of the pentane and heavier from the gas with the minimum oil rate, one-third of the butane, or 840 gallons will be removed, and one-tenth of the propane, or 558 gallons. The average refinery will be able to utilize the entire 840 gallons of butane so that this leaves only the 558 gallons of propane available for liquefied gas.

Under average operating conditions this quantity of hydrocarbons could be removed by circulating 28,000 gallons of absorption oil per 1,000,000 cubic feet of vapor, and the quantity of liquid absorbed = 3,400 + 840 + 558 = 4,798, or approximately 6 gallons of absorption oil per gallon of liquid hydrocarbon removed.

If the oil rate is tripled practically all of the butane and approximately 30 per cent of the propane will be removed. Thus for an additional oil circulation of $2 \times 28{,}000 = 56{,}000$ gallons, we obtain $2{,}520 - 840 = 1{,}680$ gallons of butane, and $(0.30 \times 5{,}580) - 558 = 1{,}116$ gallons of propane, or a total of 2,796 gallons of additional liquid. This amounts to 20 gallons of additional oil per additional gallon of liquid removed.

In order to remove essentially all of the propane the oil rate must be increased to 280,000 gallons per million, or an increase of $280{,}000 - 84{,}000 = 196{,}000$ gallons of oil for an increase in $5{,}580 - (558 + 1{,}116) = 3{,}906$ gallons of additional liquid, or 50 gallons.

The cost of operating a vapor recovery plant is primarily a function of the quantity of absorption oil circulated so that the cost per gallon of liquid hydrocarbon produced is measured by the number of gallons of absorption oil which it is necessary to circulate in order to obtain it. Thus it will be seen that in estimating the cost of producing liquefied gas, three different costs must be used, depending on the percentage of material to be removed.

Under present prices of liquefied gas it is doubtful if there are any instances where it would pay to remove the last 70 per cent of the propane.

More Construction Camps Due for Butane Service

BUTANE-PROPANE will play an important part in the construction of the electric distribution line from Boulder Dam to Los Angeles, as a result of the Los Angeles Department of Water and Power decision to use central gas plants for fuel supply at its construction camps along the line route.

Four definite camp sites have already been selected, with five additional ones in prospect. Bids already have been received covering the gas plants and storage, a year's contract for fuel with option on supplying fuel an additional six months, several hundred space heaters, and a number of water heaters. At each camp 3500-gallon liquid storage will be provided.

The four camp sites already named are at Harvard, Silver Lake, Kingston Valley, Calif., and Jean, Nevada. Additional camps are being considered for Bitter Springs, Lytle Creek, Stoddard Well, Victorville, Calif., and Railroad Pass, Nevada.

E. F. Scattergood is chief engineer and general manager of the Bureau of Power and Light, Los Angeles Department of Water and Power, which has the 300-mile power line project in hand.

Moisture Control for Increasing Domestic Meter Accuracy

By H. M. CRAWFORD
*Los Angeles Gas and Electric Corporation**

THE total lack of any approved design of positive displacement meters other than the present type gas meter, which was invented shortly after the discovery of manufactured gas, is almost unique in the utility or any other field. Certain improvements combined with the delivery of larger volumes have been made from time to time, but the old primary design principles are still apparent in the meters of today. The original meter was designed to replace the unsatisfactory fixed rate method of measuring gas, and it has continued to fulfill the ultimate in accurate measurement of small volumes of gas to the present time.

This lack of any radical change in primary design, while not working any hardship on the industry, has resulted in almost unlimited experimentation in order that the meter already available might be made as accurate a measurement medium as possible. The results obtained, as a direct outcome of this intensive study, have been remarkable when it is considered that the average meter remains on the consumer's premises for an average period varying from 5 to 10 years without any care or attention whatever. No other mechanical device of any type is subjected to such service with the expectation of so high a degree of utility and accuracy.

Every possible economy is exercised to protect meters on consumers' premises so as to safeguard their accuracy and operating conditions throughout their active life which, in California, is seven years. However, in the majority of cases, the meters are installed in more or less exposed positions under houses; others are set in basements, cellars, hallways or other rooms, facing walls exposed to all weather conditions, and sometimes in the yards of homes. From these conditions, it is readily understood that the life of a meter is a hard one, and that the accuracy records established by them are phenomenal. In addition to these adverse conditions, they are subjected to extremes of pressure and gas-conditions. Normally, meters will perform very well; after all, they are built to register the passage of gas, and when they must handle a gas of greatly varying moisture content, coal tars, naphthalene and other line debris, it is no wonder that some deviation from accuracy has resulted. Of late years more attention has been paid, with gratifying results, to the type of gas released into the distribution systems.

The discussion to follow is submitted to make available sufficient information as to the various conditions and factors which affect meter proof. These conditions and factors are discussed as to their relation to and effect on each other wherever possible. For example, diaphragm tanning, diaphragm treatment and humidity, each has its effect but in variable amounts and many comparisons are given, the whole plan being to derive the best possible maintenance and operation schedule as to meter accuracy.

After an analysis of the question it was decided that variation in the following parts would affect accurate measurement most seriously:

A. Tangent
B. Valves
C. Links
D. Carrier Wires or Flag Arms
E. Valve Packing
F. Wear of Parts
G. Diaphragms

Any serious damage to the tangent of a meter might cause the meter to go either fast or slow or completely stop its operation. However, the possibility of something similar occurring in the case of sufficient meters to affect the over-all proof of all meters is very remote.

Much discussion has been given the effect upon the accuracies of meters caused by the grinding, wearing-in action of meter valves while in operation. It is possible, in the case of an improperly ground valve seat and valve, that the meter may speed up in actual operation. This may result from either of two causes. In cases of excessive valve wear the displacement may be reduced to such an extent as to cause the meter to register fast, but where proper precautions have been exercised in the process of repair little chance of this condition is taken. In other cases, an improperly ground valve may show leaks at slow rates of flow, but when set on a consumer's premise and operated, these leaks will gradually close, due to the lapping action of the valve and seat, and a fast meter will result. Neither of those two effects will be felt in systems where meters are properly repaired. All meters repaired by the Los Angeles Gas and Electric Corp. are subjected to a small flame test prior to adjustment. This test is not an accuracy test, but is made to determine whether the meter will register gas at the rate of one-fourth cubic foot per hour. A meter equipped with diaphragms and valves which are tight enough to register at this rate will, when properly adjusted, be accurate at all rates of flow. This assertion has been proven by testing meters against provers at this rate of flow. Therefore, it is difficult to understand how a meter, repaired under these rigid requirements, could speed up in operation because of either of these two reasons.

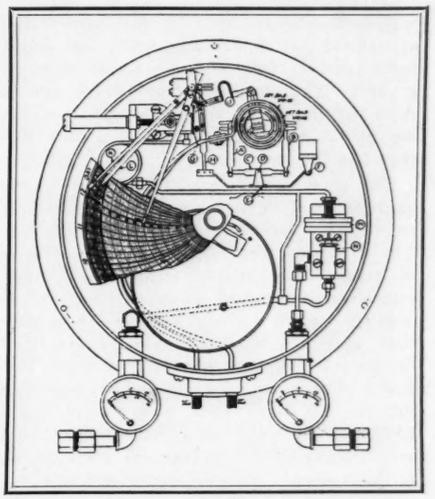


Fig. 1. Saturation control system.

Changes in proofs because of damages to links, carrier wires and flag arms are more general in character and may result in either fast or slow registration; yet where consistent modernization procedures are maintained, little difficulty is encountered.

Proper packing of meter glands requires inspection and reasonable care on the part of meter repairmen. The trend in this case is toward speeding up in proof as the packing gland loosens up due to initial wear. This corporation has experienced very little difficulty from this cause, which has, no doubt, been due to proper repair methods. The range of adjustment is wide enough to result, particularly in the case of single gland meters, in very little, if any, change in registration. No difficulty is experienced with packing.

Normal wear in meters results in slow registration, but very little difficulty is experienced because of rigid repair specifications. Clean gas also plays an important part. Excessive wear was expected because of the large quantities of dust liberated in the system subsequent to the change-over to a straight natural gas, but very little dust is recovered in the small domestic meters under discussion.

Repair shop practices, as they affect gas meter accuracies, are most important, and constant study is imperative to maintain economical and proved repair practices which will insure long and accurate meter life. Radical changes in any one of the

*Presented before the Southern California Meter Association, May 25, 1933.

many variables must be studied closely before adoption for it must be borne in mind that once the meter is set, years elapse before it is removed and retested. Modern repair shops adopt the piece work basis of repair, where a man becomes expert at one type of repair, which results in a very high quality of workmanship.

Almost immediately after the introduction of natural gas in January, 1927, fast meter percentages increased so rapidly as to cause grave concern over the accuracies of meters. A direct result of this condition was the instigation of investigations of which this report is the result.

The study was begun by making an exhaustive analytical survey of all available records to determine the exact situation. These records were assembled in the forms of tables from which many curves were compiled. Continued study of these curves indicated trends under past repair shop practices and gas conditions. As a result of these studies various changes in practice were made. For instance, steam and oil injections into the gas were made at the point where gas was fed into the distribution system, which immediately checked the speeding up of the meters. This injection program was not instituted at that time to arrest the fast tendency of meters, but to stop the rapid increase in unaccounted-for gas. The results of the institution of this practice are contained in the 1932 Proceedings of the Pacific Coast Gas Association and need not be repeated here. Certain changes were made in repair methods which also had a very beneficial effect upon meter accuracies.

Among the first conditions investigated were the meter diaphragms. The meters used by this Corporation are iron meters and tin meters with the diaphragms of the two types of meters being entirely different in design.

The iron meter diaphragm is an almost flat piece of sheepskin which moves back and forth in the meter with a rolling motion somewhat as a hinge would swing, folding back and over itself as it moves in and out.

The tin meter diaphragm construction is similar to a bellows and merely opens and closes as the meter operates.

Many years of experimentation and study have gone into the tanning and treatment of these diaphragms with the object in view that a maximum of life might be realized. Prior to 1927, hemlock-tanned diaphragms were used almost universally, and much trouble was experienced particularly in low pressure systems using manufactured gas. These conditions resulted in the development of the so-called semi-chrome tanned diaphragms. Hemlock-tanned diaphragms are very susceptible to moisture which rots them in a very short time, while the semi-chrome tanned diaphragms are more impervious to water. A simple test, whereby a piece of hemlock-tanned leather and a piece of semi-chrome tanned leather are placed in hot water, shows this very clearly. The hemlock-tanned leather will shrivel, dry, crack and break, while the semi-chrome tanned leather will remain practically unchanged.

As mentioned above, the investigation first made indicated the desirability of certain information which would be possible only by conducting certain experiments, and the first tests were run-in tests and diaphragm treatment tests.

Records indicated that approximately 50 to 60 per cent of the meters sped up in proof from 2 to 4 per cent almost immediately after they were set, after which they remained practically constant. This indicated that it might be possible to give all repaired meters a preliminary run-in of approximately 500 cubic feet before they were adjusted. To prove this conclusively, a test set-up was made on which 18 meters were set. Gas was passed through these meters at various rates for short periods of time. The meters were removed and tested after consumptions varying from 100 cubic feet to approximately 13,000 cubic feet. These tests were made during April, 1928. The results show that during the first 1,000 cubic feet passed, 13 of these meters sped up in proof approximately 1 per cent, while several had sped up and then slowed down again, others remaining practically constant. However, after passing 5,000 cubic feet of gas the total increase in proof was 1.3 per cent with individual increases up to 4 per cent. The results also show that some of these meters both increased and decreased their proofs at the ends of various runs, indicating that the proof does not necessarily remain constant. It was thought, at the time, that it might be possible to correct this speeding up tendency by either adjusting the meters 1 per cent slow instead of zero at the prover before being set, or running the meters in prior to their adjustment, but before either plan had been followed another test had been started and further data were obtained which called for a revision of opinion.

This second test was made primarily to discover the effects upon accurate measurement of various diaphragm treatments. Almost every manufacturer, meter superintendent or meter repair shop foreman seemed to have his own conceptions on what constituted an oil or mixture of oils with which to treat meter diaphragms to obtain the best preservative, most resistive to all types of gases. It was thought that by conditioning diaphragms with a large number of different treatments, and then trying them out on a test rack, some one treatment might be discovered which would be outstanding and worthy of study.

The actual data and results of these tests are available but it is sufficient for this paper to state that none of these tests indicated that any improvements might be expected. The run-in tests indicated that an initial increase in proof resulted, but that if successive amounts of gas were passed through the meters either a speeding up or a slowing down in proof might result, while the different diaphragm treatments experimented with all behaved quite similarly to those in use at the present time.

This unstable proof is one of the most important results of these tests, and demonstrates the difficulty of maintaining constant proof even after the meter has been broken in prior to being set. Another factor brought to light by this test is the almost unbelievable quantities of gas metered by the average meter before it will show any indication of losing proof because of worn parts. Some of these meters have passed over a million cubic feet of gas and still show no signs of breaking down. The average consumer will use approximately 40 M cubic feet of gas per year, and on that basis the above mentioned meters have passed the equivalent of 25 years of active service from the standpoint of meter mileage. Combine this point with the fact that meters which leave the meter repair shop are in as nearly perfect condition as it is possible to make them, and it is difficult to demonstrate that the average meter, remaining on the consumer's premise for a period of seven years, deteriorates from the so-called mileage it runs.

The foregoing discussion on the effect of various meter parts relative to radical changes in proof indicates that very little change in proof results from any of the causes given, so the natural conclusion is that most major variables result from changes in diaphragm shape, structure or moisture content.

The final factor which causes changes in meter accuracies is meter diaphragms. Diaphragms should withstand at least two old-age changes, and in cases where proper attention is paid to the condition of the gas metered, a substantial increase over this period of time should result. An idea of the importance of this may be obtained when it is known that in various situations a few years ago DR percentages as high as 15 per cent were not uncommon, while today DR percentages as low as 1 per cent are very common. This improvement has been due, principally, to the care given in properly conditioning the gas metered.

This new theory is the application of a method of control of meter accuracies while they are on consumers' premises by controlling the moisture content of the gas. This control has actually been applied in an indirect manner in this corporation with much success and there only remains the modernizing of present methods.

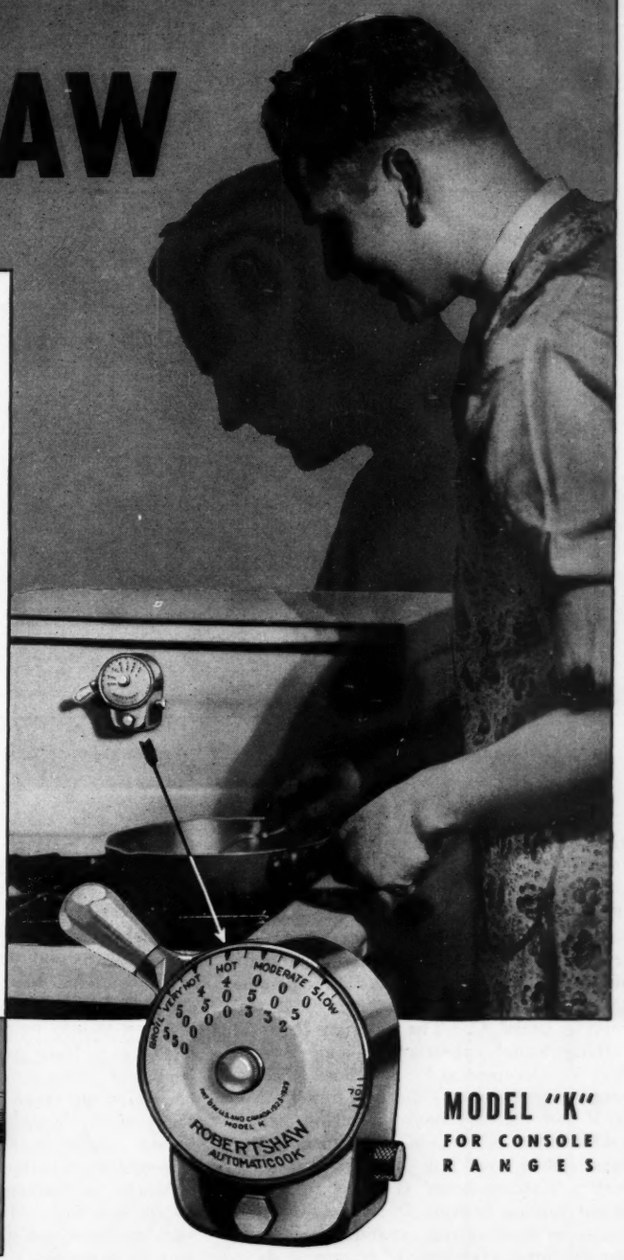
A test set-up was installed by means of which the moisture content of the gas could be automatically controlled by the maintenance of such a depression between the wet bulb and dry bulb thermometers of the instrument as was desired. This depression, once set, remained constant until reset. The use of this instrument made it possible to test meters by passing constant moisture content gas through them at any desired rate of flow or for any period of time.

Since the problem is to produce a certain "wetness" or relative humidity, the proper control instrument is one which operates on the psychrometric wet and dry bulb principle. It must also be of a type which will maintain the most constant relative humidity regardless of change in gas temperature. The saturation controller used (Fig. 1) operates by maintaining a constant depression between the dry bulb and the wet bulb and thus maintains a minimum variation in the set relative humidity for a maximum change in the gas temperature.

The saturation control system consists essentially of a psychrometer bulb housing, a V-port steam regulator valve, a small gas booster and a dry bulb and depression recorder-controller, combined with the valves and fittings necessary for assembly.

The assembly is so constructed that a continuous sample of the gas to be treated is passed over the dry bulb and wet bulb and by means of the booster is pumped back into the gas main. To maintain a constant re-

Any Man Can Cook
with a
ROBERTSHAW

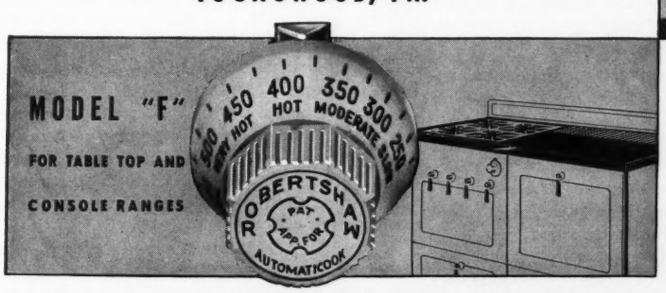


● Although it is the woman who takes the initiative in the buying of a new gas range, the decision is seldom made until it has also met the approval of the man of the house. And the one thing that justifies a new range to most men is the Robertshaw Oven Control.

● The man who insists on automatic temperature control in the cooling and lubricating system of his car, and in the maintenance of his furnace, is quick to see the good sense of automatic oven control . . . the freedom it gives his wife from kitchen drudgery . . . the certainty of better cooking and the economy of correct use of foods. When a man is sold on a device of that kind, he also wants to make sure that it is the best engineered device for the purpose.

● No man . . or woman . . who knows the Robertshaw record for trouble-free performance on more than 1,700,000 ranges wants to take any chances with makeshift, unknown, "just-as-good" oven controls. Be sure *now* that you have a representative showing of Robertshaw equipped ranges and have your sales people "all set" to demonstrate the Robertshaw to every gas range prospect. It's the best way, you know, to sell *good* ranges at *profit-making* prices.

ROBERTSHAW THERMOSTAT COMPANY
YOUNGWOOD, PA.



MODEL "K"
FOR CONSOLE RANGES

ROBERTSHAW
"AutomatiCook"

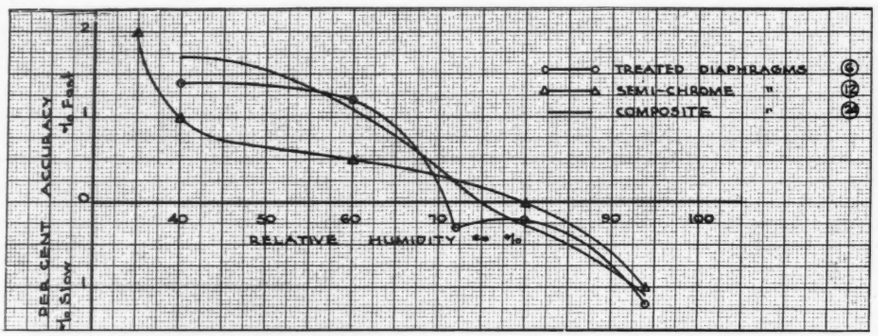


Fig. 2. Curves showing changes in accuracy; gas at various relative humidities.

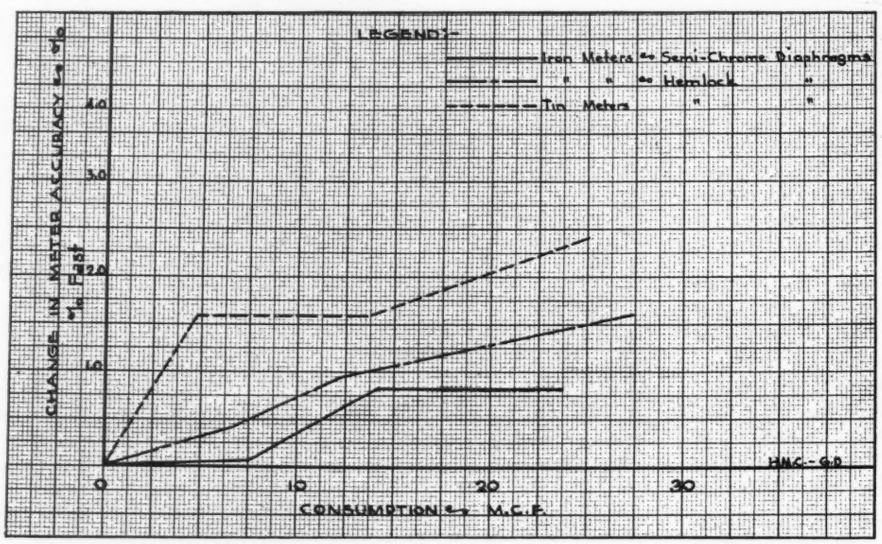


Fig. 3. Change in meter accuracy; gas at constant relative humidity, 62 per cent at 63 degrees F.

lative humidity this instrument utilizes a very simple mechanism to obtain the requisite action.

Fig. 1, illustrating the saturation control system, is described as follows: "Two mercury Bourdon Springs from the wet and dry bulb systems are mounted one above the other and are connected by links A and B to a 'walking beam' C. The fulcrum D of the 'walking beam' operates the long lever E which is fulcrumed at F and whose other end operates the flapper G through link H. Note that if both mercury Bourdon Springs expand equally there is no action because link A pushes down and link B pulls up merely moving 'walking beam' C on its fulcrum D but not moving fulcrum D. When, however, the one mercury spring expands more or less than the other, fulcrum D is moved up or down, thus moving lever E, link H and flapper G, thereby operating the diaphragm valve.

"The operation of flapper G opens, closes or throttles a small orifice or bleed. When this flapper valve is open the gas bleeds out from this orifice deflating capsular spring air relay M. When flapper valve is fully closed air relay M is inflated and of course partial closing of the flapper valve causes partial expansion of M. Air relay M operates the TAG pilot ball valve N which regulates the gas pressure on the diaphragm top of the steam valve whose operation is obvious. By means of the 'double relay' arrangement only a very small amount of power is needed and consequently the pen arm is not restricted in its moving."

In situations where the by-passed sample gas may be bled into a low pressure receiver the booster may be eliminated.

The experience gained through manual injection of steam showed the need for tests to determine the range of humidities permissible for control. This knowledge was essential before a study could be made of the distribution system to determine the practical difficulties to be overcome in applying controlled steam injection. Humidity varies inversely with pressure and directly with temperature, and as pressures vary from 60 pounds per square inch to 8 inches of water column, and temperatures vary from 50 degrees to 90 degrees, definite limits upon the per cent humidity that it is possible to obtain, were present from the first.

These tests gave the humidity range necessary for a maximum accuracy under test conditions as between 65 per cent and 85 per cent relative humidity. It must be remembered that these results were for a comparatively short length of main between the automatic humidifier and the meters on the test rack. The conditions must be modified to some extent to meet field conditions as to pressure and temperature variations, and the distance the gas is pumped to consumers through a large variety of pipe diameters.

Two sets of curves are submitted to illustrate the degree of control which it is possible to obtain thorough saturation control.

Fig. 2 ("Curves Showing Changes in Accuracy; Gas at Various Relative Humidities") gives the results of tests already completed. Three different groups of meters were experimented with as shown. Gas of constant relative humidities, as shown, was passed through these groups in quantities varying from 1.2 M c. f., to 10 M c. f. The curves show that for relative humidities below 65 per cent a definite speeding up in proof will result, for relative humidities about 85 per cent definite slowing down occurs, but that with relative humidities between 65 per cent and 85 per cent, at whatever temperature the gas is measured, a maximum accuracy will result.

The results of this test raised the question as to the extent to which any one relative humidity might affect the proof of a group of meters over an extended period of use. As a consequence, further tests were made on three groups of meters the results of which are shown in Fig. 3. ("Change in Meter Accuracy; Gas at Constant Relative Humidity, 62 per cent at 63° F.") A total of approximately 25 M c. f. has been passed through these meters to date; three tests having been made at intervals of approximately 5 M c. f., 12 M c. f., and 25 M c. f. As may be noted from these curves an increase in proof has resulted in each group. The tin meter curve shows no increase in proof during the second run while the iron meters with semi-chrome tanned diaphragms show no increase during the third run. Because of conditions beyond control, a fourth test was made at a relative humidity of 71 per cent at 62° F., with a resulting very slight increase in proof of both sets of iron meters, and a slight decrease in the case of the tin meters. The fourth run increased the average quantity of gas passed by each of the three groups of meters to approximately 60 M c. f. of gas. Due to the lack of extra equipment the test has been run by using controlled gas which was by-passed from that which fed the high pressure part of the distribution system. A slight speeding up in proof of meters in the field shortly after the beginning of the fourth run necessitated the increase of the relative humidity of this sendout gas, which resulted in an increase of the test gas from 62 per cent to 71 per cent. To complete this test additional equipment will have to be obtained. It will be noted in both sets of curves submitted that those meters equipped with semi-chrome tanned diaphragms vary the least under humidity control.

The number of tests run are few, it is admitted, but the trends obtained are conclusive and may be expected to change through further tests in degree only.

With this knowledge available, the application of it to field conditions becomes relatively simple. Field conditions as to pressure and temperature at various times of the year are known, and it is only necessary to inject a gas humidified to such an extent that

DEALER LETTER NO. 1

PACIFIC GAS AND ELECTRIC COMPANY
245 Market Street
SAN FRANCISCO, CALIFORNIA

Gentlemen:

Re: COPY APPEALS used in P. G. and E. promotional advertisements.

The P. G. and E. advertising in your community is constantly creating prospective buyers of GAS appliances.

They should be your prospects—eventually YOUR CUSTOMERS, if you cooperate with TIE-IN ADVERTISING of your own.

Our copy is strictly promotional. Various TYPES of GAS appliances are featured but specific MAKE and PRICE are seldom referred to.

Direct sales appeals are left to you. The invitation to "See Your Local Dealer" is prominently displayed.

When general mention is made of special features or new improvements, QUALITY is implied.

No concessions to "cheap" or substandard merchandise ever appears in either copy or illustration.

Dealer TIE-INS, offering a high grade MAKE at a fair PRICE will be strengthened and supported by the P. G. and E. promotional advertisement appearing along side.

We strongly recommend that you TIE-IN this month, and every month, for a more profitable GAS appliance business.

Sincerely,

H. M. Crawford

General Sales Manager.

YOUR TIE-IN AD HERE
TELLS PROSPECTS THAT
YOU SELL
THE APPLIANCES ADVERTISED BY
P·G·and E·

WG 208-833

when acted upon by existing pressures and temperatures in the field, a relative humidity between 65 per cent and 85 per cent is obtained. As relative humidity varies in accordance to definite physical laws, these technical problems may be easily calculated for each specific example. One important point to bear in mind is this: The less the gas expands after injection, the more readily the required relative humidities will be obtained. No control of gas temperatures in the mains of the distribution system is possible, but as the temperature of the gas at the point of injection is above these main temperatures for all times of the year, this temperature difference will not act toward higher relative humidities.

Another important point brought out by the test is the difficulty of obtaining any accuracy of control by manual operation. This was attempted during the test, and though temperatures and consumptions were constant, very poor control resulted. The range of permissible humidities is not wide enough to permit any control other than automatic.

Southern California Gas Co. Sponsors Meter Program

SOUTHERN California Meter Association's seventh year got off to a strong start at the July 27 meeting, held at Lakewood Golf Club, Long Beach. After an excellent dinner President C. B. Heartwell introduced the business meeting, with several innovations the order of the day.

Beginning with the July meeting, attendance prizes consisting of a free dinner, are being issued. Three names are drawn and from them the member with the best attendance record is accorded the free dinner ticket.

The treasurer's report, given by R. F. Angell, showed the Association's finances to be in splendid condition.

Program features for the July meeting were sponsored by the Southern California Gas Co., with B. G. Williams acting as master of ceremonies. The opening paper was presented by Frank L. Smith, being prepared in collaboration with Mr. Williams, on the subject "The Design of Orifice Meter Charts". The paper presented a method for computing diameters of the circles on charts from fixed characteristics of the meter. The error in present practice of using the same circles for both differential and static pressures was discussed, and a remedy suggested.

W. P. Hand, sales engineer of the Southern California Gas Co., gave a very interesting discussion of survey work conducted by the new business department of his company in determining domestic market characteristics and possibilities. The paper was illustrated by graphic results of surveys run in the company's territory.

Gordon Greene of the Associated Oil Co. announced the monthly golf play for association members, held July 29 at the Lakewood course. The event was styled a "Prosperity Tournament", and each player was to receive $1,000 in stage money to cover penalties incurred during play.

B. G. Williams on behalf of S.C.M.A. tennis fans announced Saturday afternoon, August 5, as date for the next tournament at the Chanslor-Canfield Midway Oil courts at Torrance.

Good August Program Arranged

Plans for the August meeting of the Association are already well advanced, the program being sponsored by the Union Oil Co. A paper of general interest will be given by K. E. Kingman of the Union staff, on the subject "Modern Gasolines, and Why". A second paper on gas compression and gas engines will be presented by A. K. Hegeman of Smith-Booth-Usher Co. Entertainment features by Union Oil talent will provide additional interest, and a good attendance is anticipated.

Pressure Relief Valves for Low Pressure Systems

(Continued from Page 11)

1—The piston travels some distance from the mercury before the valve starts to blow. Consequently, the tendency to blow mercury is reduced to a minimum.

2—The reduction in pressure required to lift the piston compensates for the friction drop resulting from the flow of gas through the valve. Consequently the valve can discharge a large quantity of gas without permitting the pressure to build up beyond the point at which the valve originally opened.

3—As the valve returns to the closed position it snaps shut as soon as the piston touches the mercury. This tends to prevent the blowing of mercury.

Two sizes of valves are built; the 4-inch with a rated capacity of 35,000 cu. ft. per hr. and the 8-inch with a rated capacity of 70,000 cu. ft. per hr. Two pounds of mercury are required for the 4-inch valve and four pounds for the 8-inch valve.

In a new regulator-vault installation, space is provided within the regulator vault for the relief valve. The connection for the relief valve is made between the outlet of the regulator and the outlet valve. This same location is used when a relief valve is installed in an existing regulator vault if there is space in the vault.

If there is not available space in the regulator-vault, the relief valve is located in a special parkway vault. The connection leading to the vault can then be made between the outlet of the regulator and the outlet valve of the regulator set-up, if convenient, or it can be made directly to the gas main at a point outside of the regulator-vault. In this latter case the connection can be as far downstream from the vault as desired, providing no service or main connects between the relief valve connection and the regulator. When the connection for the relief valve is not made between the outlet of the regulator and the outlet valve of the regulator set-up, a valve is installed in the line leading to the relief valve to permit the inspection or removal of the relief valve.

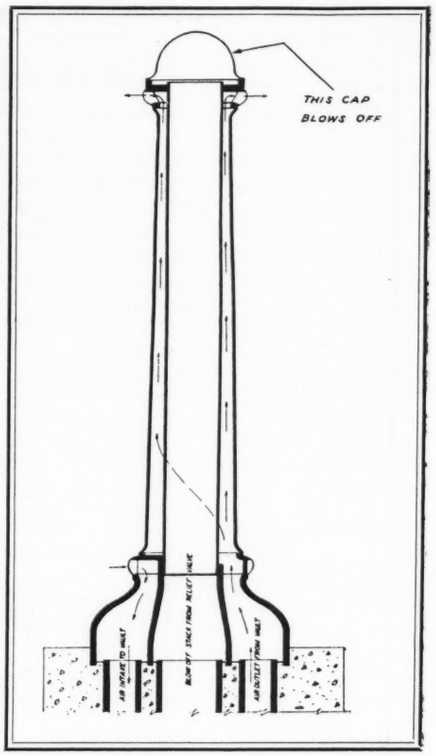


Fig. 4. Combination blow-off stack and vault ventilator.

In the parkway vault installations the ventilating air enters at the base of the fluted column, passes down through the parkway vault, then through a 6-inch pipe into the regulator vault in the street. From the regulator vault, the air passes back through a 6-inch pipe into the base of the ventilator. By using air circulation in this direction the parkway vault is kept dry, permitting the installation of recording pressure gauges in the vault. This direction of ventilation also causes any gas that leaks into either vault to be discharged safely at the top of the ventilator.

The special combination blow-off stack and vault ventilator is shown in Fig. 4.

The stack into which the relief valve blows cannot be located near a second story window or at any place where the blowing of gas into the atmosphere will create a hazard. If a suitable location for the stack is not available in the vicinity of the regulator vault, a series regulator set for 1 pound or less discharge pressure, is installed ahead of the low-pressure regulator, thus eliminating the need for a relief valve.

Installation Cost Data

The principal items used in relief valve installations and their costs are:

1.	4-inch relief valve	$52.24
2.	8-inch relief valve	73.82
3.	Fluted column vent, complete	47.84
4.	Cast iron flue assembly (Used in parkway installation only)	32.09
5.	Cast iron elbow with inspection plate	5.47
6.	Special cast iron fitting	5.01

The special fitting mentioned above is provided to connect the relief valve elbow within the vault to the vent pipe on the outside of the vault.

The following are average costs arrived at from a number of installations on our lines:

1. Installation of 8-inch relief valve in parkway vault at some distance from regulator set-up, including vault, relief valve, 8-inch gate valve and miscellaneous fittings and vents, $363.25.
2. Installation of 8-inch relief valve in parkway vault at regulator vault, $283.40.
3. Installation of 8-inch relief valve in regulator vaults, $248.81.
4. Installation of 8-inch relief valve set above ground at distribution station, $161.58.
5. Installation of 4-inch relief valve in regulator vault, $209.71.
6. Installation of a series regulator in place of 8-inch valve, $647.47.

It will be noted that the installation of the series regulator is considerably more costly than the installation of a relief valve. In the case referred to in (6) above, a 3-inch low-pressure regulator was replaced with a 4-inch low-pressure regulator and a 3-inch high-pressure regulator set for 1 lb. outlet pressure was connected in series. This type of installation will always be more costly as the vault will have to be enlarged or rebuilt. The cost given includes the actual labor and material, less the salvaged value of the 3-inch low-pressure regulator. In this case the original value of the 3-inch regulator was allowed as salvage.

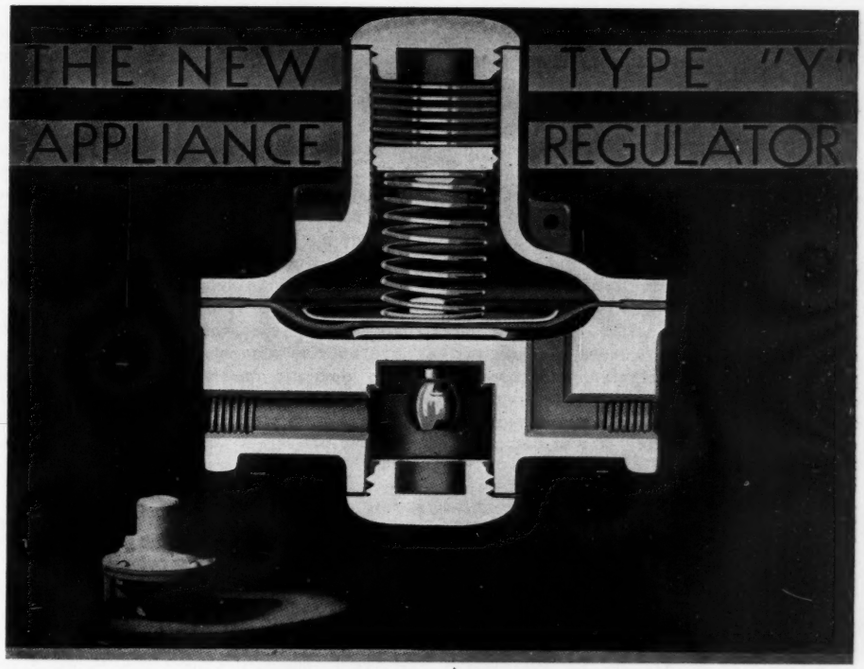
Operating Data, Including Costs

Relief valves are inspected during regulator and vault inspections, which are made once a month. Since a special trip is not necessary and men are already in the vault for regulator inspection, it can be readily seen that very little labor and no additional mileage is required for this work. After regulator repairmen complete repairs on regulator, or inspection, as the case may be, they connect a portable low-pressure recording gauge on the line to the relief valve. They then open the inlet valve to the regulator set-up, leaving outlet valve closed, and weight the regulator until the relief valve opens, which point will be recorded on the chart. These charts, bearing location of relief valve, date of test and showing pressure at which valve opened, are then filed in the district superintendent's office. The inspection plate on the special C.I. elbow is removed and valve piston is raised by hand for its full travel to ascertain that it has no tendency to stick at any point.

The felt sealing ring is oiled, which oils the side walls of the cylinder, and keeps the felt in a soft and pliable condition.

Relief valves installed downstream from a regulator vault are serviced in the same manner except that a bottle of compressed natural gas is used to raise the pressure under the valve, to determine the point at which the valve opens.

It is possible in all cases to test the relief valves without placing a high pressure on the distribution system. Time consumed for a test is 15 minutes per relief valve, and since a man working in a vault must have a ground man or watchman, it will be equivalent to one man 30 minutes at an average



APPLIANCE manufacturers and gas companies alike welcome the development of this new regulator. ● We invite your attention to its performance characteristics, ruggedness and simplicity. ● Now available in 1/4, 3/8, 1/2, 3/4, 1 and 1 1/4-inch sizes at attractive prices.

For detailed information address:

RELIANCE REGULATOR CORPORATION

1000 MERIDIAN AVE., ALHAMBRA, CALIF.

Manufacturers

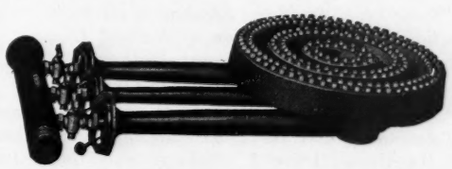
Gas Regulators for All Purposes

REGULATORS YOU CAN RELY ON — RELIANCE — SINCE 1918 — TRADE MARK

RELIANCE

Flexible Heat with the Johnson 60 BCE Ring Burner

Three powerful burners combined into one useful flexible unit—that's the Johnson 60 BCE. Each burner has a separate valve. Improved Johnson design produces higher flame temperature. Write for interesting catalog and price list.



JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA

Pacific Coast Representative—C. B. BABCOCK CO.
135 Bluxome St., San Francisco, Calif.

of 75c per hour or 37½c per valve per month.

On three occasions since the installation of relief valves on our system, incidents have occurred that have convinced us that the investment made in these installations has been well justified. The most noteworthy of these occurred within the last three months. A 2-inch low-pressure balanced valve regulator in Covina stuck open, causing the low-pressure system to build to 19.5 inches of water, at which point the relief valve opened. When the relief valve opened and a volume of gas suddenly passed through the regulator, the disturbing element was apparently removed, at least temporarily, for the regulator's subsequent operation was normal. As the regulator crew was busy elsewhere and the regulator was functioning properly, it was not opened on that day. However, the following day the incident recurred, with the relief valve again acting as has been described. This day the regulator was gone into and it was found that pieces of gasket material were coming off the valve box inspection plate gasket and fouling the valve action. Instead of having a regulation gasket on the valve box of the regulator, a piece of heavy permanite had been cut to conform to the outside dimensions of the plate and the center of this had become softened and was tearing away. Since there is 50 lb. pressure at the inlet of this regulator, it is obvious that if there had been no relief valve the pressure would have built to a point that would have ruptured domestic meters. It is possible that use of the relief valve in this one case saved us the total cost of equipping all of our low-pressure systems with relief valves.

Industry Getting Ready for Annual Sessions

EYES of the world's gas industry will be centered on Chicago, Ill., during the week of September 25, during which the American Gas Association, the International Gas Conference, and the Natural Gas Department of the A.G.A. meet in convention. It will mark the 15th Annual Convention of the A.G.A., and the Annual Convention of the Natural Gas Department put over from May until September in order to give its members an opportunity to visit the Century of Progress Exposition, and to meet with the other two groups. The conventions will be held at the Stevens Hotel.

September 26 has been designated as Gas Industry Day at the Exposition in honor of the three meetings.

The program of events for the Natural Gas Department sessions, to be held Monday, September 25, has been set up in final form, according to A. E. Higgins, secretary of the Department, with the following addresses and reports scheduled:

Opening remarks and chairman's address: George W. Ratcliffe, Manufacturers Light and Heat Co., Pittsburgh, Pa., Chairman.

Report of main technical and research committee: H. C. Cooper, Hope Natural Gas Co., Pittsburgh, Pa., chairman.

Report of nominating committee and election of officers: T. J. Strickler, Kansas City Gas Co., Kansas City Mo., chairman.

"Taxation as It Relates to Utility Companies": Paul S. Clapp, Columbia Gas and Electric Corp., New York City, New York.

"Some Legal Problems Peculiar to the Production and Transportation of Natural Gas Arising Out of the Economic Depression": G. J. Neuner, Panhandle Eastern Pipe Line Co., Kansas City, Mo.

"Rate Schedules for Load Building": F. C. Hamilton, Henry L. Doherty and Co., New York City, New York.

"Selling the Value of Natural Gas": E. M. Tharp, Ohio Fuel Gas Co., Columbus, Ohio.

"The Generation of High Calorific Value Gas as a Substitute for Natural Gas for Emergency and Peak Load Service": Frank Wills, Pacific Gas and Electric Corp., San Francisco, Calif.

"Natural Gas as a Competitive Fuel": Harry E. Randall, United Gas Public Service Co., Houston, Texas.

"Relation Between Gas Reserves Developed and Undeveloped, and Market Requirements": J. H. Dunn, Lone Star Gas Co., Dallas, Texas.

Rental and Sales-Rental Plans

(Continued from Page 8)

purchase of the rented radiant heater, or on the purchase of any other model desired.

Experience has shown as high as 85 per cent conversions in one year from rental to outright purchase.

It is the easiest and least expensive method of selling the idea of gas fireplace heating. It is an introduction of gas into the home which eventually will lead to complete house heating.

To the older gas men the rental of commercial gas arc lamps is a familiar story. It was successful and sustained our profitable lighting load for a long period of years.

Undoubtedly the lighting business saved our industry, for we held this load until the modern gas range was ready to take its place.

If, in the earlier days, gas lighting had been driven from the field by its strong competitor, electricity, we could not have survived.

Twenty years ago the ratio of gas uses was 50 per cent lighting, 35 per cent cooking and heating, and 15 per cent industrial.

It will be recalled that there was never any objection on the part of dealers, legislators or propagandists to renting arc lamps. Incidentally, real service on the part of the gas company was part and parcel of the commercial lighting business. It was the general policy to rent but not sell gas arc lamps.

There has been some adverse legislation and more proposed against gas companies selling appliances on a merchandising basis.

We have in the past decade lost sight of some of the basic principles governing the gas business, in our desire to show a merchandising profit.

We have attempted merchandising on a large scale. Sales managers talked in terms of total sales of appliances in dollars and cents. Many big records were achieved, which upon analysis showed sales of high priced units which were very low gas consumers.

If price is commensurate with quality and real load building, no complaint is coming, but to strive for a large merchandise quota without proper consideration of load is bad business.

It has hurt us in two ways, first, by arousing the antagonism of dealer organizations, and secondly, diverting too much energy and money into sale of poor load building equipment.

The rental plan may be analyzed as follows: The objective is to sell gas; to build permanent load; to tie the consumers closely to the gas company; to render better service.

Our motives are clear. We are not seeking merchandising profit or the sale of appliances for the sake of sales records. The plan is in reality an honest, aggressive effort to sell our product—gas—the appliance being only an incident on the way to our goal.

Certainly there cannot be any valid objection to the gas company selling gas with load building as the only objective.

It should be made very clear that I do not advocate the rental of all gas appliances, nor the rental plan to the exclusion of direct sales. There are certain appliances, however, which lend themselves to the idea—all of which have been mentioned in this paper.

The gas company salesman should be permitted to rent certain appliances or sell them outright as circumstances dictate.

In conclusion may I present a summary of the advantages of this plan from the standpoint of the consumer and the gas company, as submitted at the New England Regional Gas Sales Conference.

What this Plan Means to the Gas Company

1. An opportunity to increase the domestic sales per meter without increasing existing plant investment.

2. Gas is already reasonably popular in the home for cooking and water heating. Space heating by gas in the home has as yet not been fully appreciated. Auxiliary heating is an entering wedge and a stepping stone to central heating with gas.

3. Profitable load due to existing rates, diversity between customers, low demand and lack of additional investment.

4. Further popularizing gas in the home by increasing its uses.

What This Plan Would Mean to the Consumer

1. Flexibility that cannot be obtained with only the central heating plant.

2. Quick, effective heat where needed as long as needed.

3. Economy due to localized heating.

4. Convenience due to lack of preparation and labor of building fire in the central plant.

5. Low investment and continuous adequate source of supply.

6. Uniform cost of operation due to lack of fluctuation in gas rates as compared to the varying prices of other fuels.

7. Small maintenance and repair costs.

Spring Sales Offensive Puts Water Heaters to Work

(Continued from Page 9)

The Pacific Gas and Electric Co.'s sales department representatives personally called on more than 200,000 homes during the campaign period.

In addition to the general publicity, the company sent 70,000 direct-by-mail broadsides to a selected list of consumers who were not using automatic water heaters. Like the newspaper copy these broadsides aimed to sell automatic hot water in the home and did not attempt to sell any one make of heater.

An important feature of the campaign was a series of impressive window displays, designed by Frank Bevan, which were exhibited in each utility office throughout the territory. These displays were changed every month and when taken out of the utility's windows were given to leading dealers for their use.

All those who actively participated in the cooperative campaign report that they were more than gratified with final results, which, considering the economic period in which this business drive was held, were phenomenal.

Gas Fuel Service Co. Gets Permit to Operate in California

GAS FUEL SERVICE CO., operating in the San Joaquin Valley, received permission from the California Railroad Commission late in July to construct a natural gas line and install service in agricultural communities in Kings and Fresno counties.

The company is affiliated with Kettleman Lakeview Oil and Gas Co., Kettleman City, Calif., which is beginning construction of approximately 25 miles of 4-inch high pressure gas line to serve the pumping load in Tulare Lake area. Gas is supplied from the Dudley Ridge district, and future plans call for the laying of approximately 400 miles of gas line of varying diameters in Kings and Fresno counties, the route of the line taking it north from Kettleman Hills along the west side of Fresno County north to Mendota and Firebaugh.

C. C. Friend is president and J. H. Fiske is vice-president and secretary of the two companies.

May Build 35-Mile Natural Gas Transmission Line in Alabama

Clanton, Ala., recently granted a franchise for the service of natural gas to the Tri-County Utilities Co. by authority of the Alabama Public Service Commission. The company is reported planning to build a gas transmission line from the Southern Natural Gas Co.'s main line to Clanton, a distance of about 35 miles, the line taking off from the main line between Robinson Springs and Coosada. Other towns to be served through this new lateral are Elmore, Speigner, Deatsville, Wadsworth, Marbury, Mountain Creek, Verbena, and Cooper.

"MODERNIZE as you repair"

THE SPRAGUE METER COMPANY

BRIDGEPORT, CONN.

Los Angeles, Calif. San Francisco, Calif.

Davenport, Iowa

Newark, Ohio. Houston, Texas.

If you would keep in touch with the Natural Gas and Butane industries, send a check for $2.00 to

WESTERN GAS
810 South Spring Street, Los Angeles

Name.....
Company.....
Position Occupied.....
Street Address.....
City and State.....

Subscription Rates: I Year $2.00; 3 years $5.00; Foreign $3.00 per year.

HIGH QUALITY—LOW PRICE

AGP

AUTOMATIC STORAGE GAS WATER HEATERS

Three models of quality water heaters at a price range to meet any campaign requirement. Each combines the highest efficiency with improved principles of design and sturdy construction. Perfectly controlled, highly efficient, yet lowest in price for comparable quality.

A. G. P. made in galvanized or Everdur tanks—20-25-30-40-75 gallon sizes.

A. G. P. SPECIAL made in galvanized tanks—20-25-30-40-75 gallon sizes.

THE DICTATOR Low-Priced Water Heater is made in galvanized or Everdur tanks—15-20-30-40 gallon sizes.

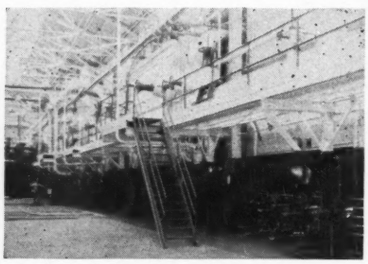
Write for Literature!

AMERICAN GAS PRODUCTS CORPORATION

40 West 40th St., New York, N. Y.

Division of

AMERICAN RADIATOR COMPANY



Dearborn

TRADE MARK REGISTERED

SEALING COMPOUND

Dearborn Sealing Compound applies easily and congeals into a tough, smooth, non-porous coat impervious to water.

Excellent for stationary boiler settings, in stopping infiltration, it is equally valuable in sealing cracked concrete walls, floors and reservoirs, keying to the surface of the concrete. Odorless, non-inflammable. Does not crack, become brittle or peel off. Also in building and repairing roofs, Dearborn Sealing Compound gives a durable seal.

Samples and recommendations sent gladly without charge.

DEARBORN CHEMICAL COMPANY

LOS ANGELES:
807 Mateo Street, Phone TRinity 3385

SAN FRANCISCO
421 Bryant St., Phone SUtter 8688

Timeliness Key of Oklahoma Natural's Advertising

(Continued from Page 12)

illustration. It was a simple announcement of the cheapness of natural gas as a domestic servant. It gave 10 items, showing how far 1 cent would go in the purchasing of good natural gas service.

After the first ad each succeeding ad attempted to anticipate or meet a situation. They were not written defensively, but were released as situations demanded, in an affirmative tone.

Oklahoma's first cold spell came around the first of the year and the company anticipated the possibility of asphyxiations, partly because the storm was unheralded and partly because customers had not been used to exercising caution with their gas appliances for several months. A warning ad was issued, giving "don'ts" in the use of appliances and also explaining that careful use of gas appliances made natural gas the safest and most useful of fuels. "Even a kitchen chair can be dangerous" was the caption, showing the chair raised threateningly in the hands of a burglar. Proper and improper gas connections also were shown.

The first storm subsided and within two weeks there was another, with the temperatures going below zero for several days. The morning the cold wave broke—and this one, too, came overnight—an ad was ready for the newspapers. It called to the attention of consumers that, although the gas consumption had increased nearly 2,000 per cent above normal in the course of a few hours, the well-trained Oklahoma Natural organization was able to meet the emergency. And it gave the reasons why. A picture of a service man working in blinding snow was used in the ad.

When it was nearly time for the bills to go out covering the cold weather period the department took an imaginary $15 bill and itemized it according to service received. "Stop!—Have you analyzed your statement of natural gas service," was the ad's heading. Eight uses to which gas had been put were enumerated. A traffic light, with the STOP predominating, and a facsimile of a gas bill comprised the illustration.

With budget balancing a fixed topic of general conversation, the department brought back to life a character named Gassy Bill, who in his logic the winter before had answered complaints three times a week in the daily newspapers. Gassy Bill, megaphone in hand, his familiar black cat at his feet and a set of balancing scales in front of him, the expense outweighing the income side, told the readers one dozen ways to save gas, thereby slashing the weight of the expense side of the scales.

Early in February the Boy Scouts in Oklahoma began to prepare for their finance drive, and at the same time another cold wave swept Oklahoma. Again overnight the gas consumption was doubled and an ad "Be Prepared" was released. This copy used the slogan of the Boy Scouts, "Be Prepared," and told that the Boy Scouts of America and "Your Gas Company" were alike inspired by this slogan. The copy explained that it was possible for the Oklahoma Natural to meet such emergencies because it was always prepared.

March came along and the department thought it well to point out that the season of high gas bills was leaving. "Three months out of 12" was the caption of the next ad, followed by words and actual figures of "You pay a high gas bill" and "you pay a very low gas bill." December, January and February average billings for a six-room house were arranged in a semi-circle, the other half of which gave a similar array of June, July and August billings. The low amounts paid were featured, and the copy went on to explain that if the gas bill could be paid evenly each month, as rent and other necessities are paid for, it would average less than $5.00 per month.

"Your Gas Company—as vital to your community as these" captioned the next price of copy. It told of high taxes paid by the company toward support of government; which would be gone under municipal ownership. The illustration was of a policeman, nurse, fireman, sailor, school teacher and soldier, with the words "as vital to your community as these" superimposed over them.

The next ad was five columns by 13 inches and standard in size where used. Headings read: "Simple, isn't it?" "You merely turn a key and get good gas service," and "BUT —It's a different story for your gas company." Here followed copy and pictures showing the process of transporting gas from well to burner tip; the system map of the Oklahoma Natural, showing the 3,600 miles of inter-connected pipelines; an interior and exterior view of a compressor station and the giant driers which are necessary. In a box were typed figures, telling salient system facts.

Summer advertisements follow the general policy of dealing with seasonal topics. One message, for example, explains that while consumption is decreasing, the gas company must maintain its elaborate system and continue to do business—with certain financial loss to follow until the heating season again arrives.

All copy-writing was done in the publicity department and art work was done by the draftsmen of the engineering department. The program was supervised by Reid S. McBeth, assistant to the president. H. Z. Sanders, who drew the historical map of Oklahoma, and Robert Ducker were the draftsmen who cooperated. The writer handled the copy and planned the illustrations.

Kentucky Public Service Co. Planning Line Construction

Kentucky Public Service Co., Elizabethtown, Ky., plans to extend natural gas service to Elizabethtown and Hogdenville, Ky., from its wells in the Bonnieville gas field. Construction is reported to be planned for completion this summer.

Norman Terry Elected Sec'y. of Saint Louis Advertising Club

ORMAN B. TERRY, assistant advertising manager of The Laclede Gas Light Co., St. Louis, Mo., was recently elected secretary of the Advertising Club of St. Louis, Mo. Mr. Terry has been active in the club's work for the past 5 years, having served 2 years on the board of governors. He served on numerous committees and for the past 2 years has acted as chairman of the Annual Awards Committee. He is assistant editor of the "Ad Club Weekly," the organization's official publication. In 1931 he was awarded a silver loving cup in recognition of his services to the Club.

Norman B. Terry

Mr. Terry has been with the Laclede company for the past six years, coming to St. Louis from San Angelo, Texas, where he was advertising manager of The Daily Standard. Copy which he has prepared for the Laclede company has won five national awards in the gas and electric field.

Death of J. D. Ryan Announced; Kerr President of Montana Power

Following the death of J. D. Ryan, president of Montana Power Co., Butte, Mont., and a member of the board of Electric Bond and Share Co. and American Power and Light Co., both of New York, announcement has been made of the election of Frank M. Kerr to the post of president of Montana Power. Mr. Kerr has been vice-president and general manager of the company since 1915.

Gas Service Co. Using Chromium Plated Flue Pipe in Range Installations

Gas Service Co., Kansas City, Mo., has introduced a new idea into its gas range installation work, using chromium plated flue pipe for all of its inside vent connections. The chromium plate not only will harmonize with the lighter colored ranges, but also will match up well with monel metal sinks and drain boards which have come into popularity.

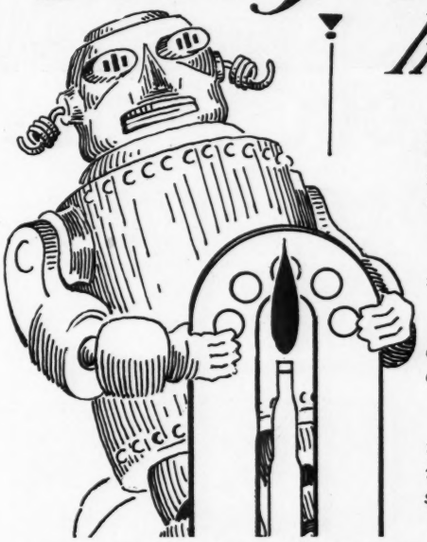
To Build Line in Lea County, N. M.

Phillips Petroleum Co. of Bartlesville, Okla., has a contract with the United Potash Co. to supply its boilers near the Lea County, New Mexico, gas field with natural gas from that field for a period of 10 years. Work on the gas transmission line will start soon.

Standard of New Jersey Moves

Standard Oil of New Jersey is moving its headquarters from 26 Broadway to Rockefeller Center, effective August 1. The new quarters are in the RCA Building Tower, the oil company occupying practically the entire main tower.

Test Power Stat
In Your own Plant



"POWERSTAT sounds interesting," one manufacturer wrote. "We, like others, have been trying to solve the pilot situation on gas appliances without success. Would you ship one on trial?"

Sure! We do it every day, so confident are we that POWERSTAT will sell itself.

Results of tests are coming in daily, everyone satisfactory, confirming what our experience has already proven.

POWERSTAT Pilot Control is revolutionary—every gas utility and appliance man should know about it. Trial order shipped without obligation. Write today.

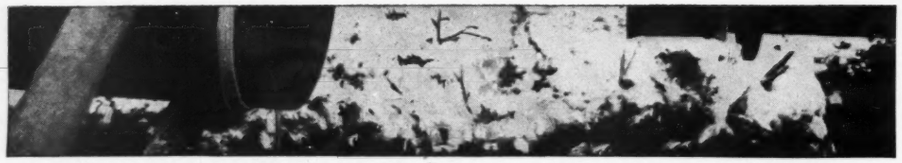
POWERSTAT CORPORATION
• 557 Market St. • San Francisco

Automatic Pilot Control

PowerStat

PAPICO
ODORIZERS
for Natural Gas Systems
Write for Engineering Data
HARRY F. HALDEMAN, INC.
ENGINEERED PRODUCTS
411 West Fifth St. Los Angeles, Calif.

The Goodman Stopper
The Reliable Shut-off for Street Mains
Equipped with Improved Patented Locking Sleeve, which locks both handles to the pipe. Stopper cannot slip. Gas cannot pass.
Safety Gas Main Stopper Co.
523 Atlantic Avenue, Brooklyn, N. Y.
Pac. Coast Rep.: C. B. Babcock Co.
135 Bluxome Street
San Francisco, California



Over 10,000,000 In Use

It's safest to specify Paranite
The leading Pipe Joint Gasket
Sold by Pipe Joint makers

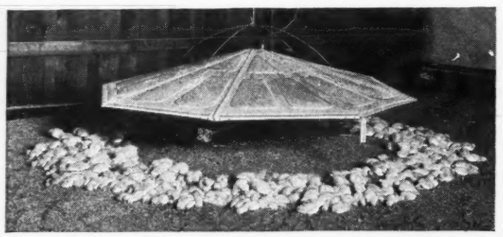
TRADE PARANITE MARK

The Manhattan Rubber Mfg. Division
OF RAYBESTOS-MANHATTAN, INC.
Executive Offices and Factories
Passaic, New Jersey

GAS BROODERS

The new type Hart Radiant Gas Brooders are causing a sensation amongst poultrymen. They are proving by far the best means of brooding chicks. Increase your sales of gas by handling this leading line. Hart Gas Brooders will raise a greater percentage of chicks with less labor and expense than any other method. All brooders thermostatically controlled—hang from ceiling—teach chicks to perch—gas pipe runs overhead with flexible gas tubing running to brooder. Get your share of the vast potential fuel load for brooding of chicks and turkeys. One poultryman is worth a dozen ordinary household gas consumers.

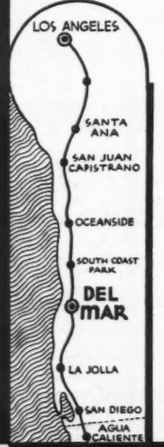
Send at once for descriptive literature, discounts, etc.



Flashlight photograph of chicks sleeping under a Hart Gas Brooder at the world's largest poultry ranch where Hart Brooders are used exclusively. One hundred and forty-four brooders in operation the year round brooding five hundred to one thousand chicks to the brooder.

H. W. HART MFG. CO., P. O. Box 404 W, Santa Monica, Calif.
More Hart Gas Brooders are being sold on the Pacific Coast than any other make.

hotel **DEL MAR**
and English Cottages



A MAGNIFICENT English-type structure, situated in its own twelve acre tropical garden—overlooking the Pacific Ocean.

Every modern convenience and sports program offered for your pleasure.

TENNIS · GOLF · FISHING
RIDING · DANCING

American Plan
from $5.00 per day

Los Angeles office - call Trinity 3161
IRVING G. DAY, Manager
THREE HOURS SOUTH OF LOS ANGELES

DEL MAR SOUTHERN CALIFORNIA

Judge Finds for Property Owner, Giving Compensation for Use of Highway

A ruling without precedent in Oklahoma was made in the district court of Ofuskee county on July 3 when Judge John L. Norman granted compensation to a property owner when a pipe line was placed in a highway adjoining his land. J. W. Johnson filed suit against the Shell Pipe Line Corp. demanding compensation for use of highway for pipe line purposes, maintaining that the land had been dedicated for highway purposes only and that the property owner was entitled to compensation for any other use of the same. The oil company's attorneys insisted that the pipe line, being a means of transportation, did not go beyond the contemplated use of the land, but the claimant was granted $60 and costs.

Fisher Governor Company Announces New Representative

Fisher Governor Co. of Marshalltown, Iowa, manufacturer of pump governors, pressure regulators, steam traps, liquid level controllers, strainers, and a complete line of similar automatic control devices, has announced the appointment of M. N. Dannenbaum Co., 304 Shell Building, Houston, Texas, as the direct factory representative in Southern and Eastern Texas.

M. N. Dannenbaum has just returned from the Marshalltown factory, where he completed a study of Fisher equipment.

Arkansas Valley Gas Co. Moves Offices to Larger Quarters

The Arkansas Valley Gas Co., Arkansas City, Kan., moved its offices on July 7 from 308 South Summit St., to 317 South Summit St. where the first and second floors of the Jarvis Bldg. have been remodeled for the gas company's use. The company had operated in its old offices for the past 15 years, and according to J. G. Mawson, the enlarged quarters make it possible to give its customers better service.

Heffelman Resigns Position With Tucson Gas Electric Lt. & Power Co.

M. C. Heffelman has resigned his position as commercial manager of the Tucson Gas, Electric Light and Power Co. to become manager of the Deming Ice and Electric Co., at Deming, N. M. Federal Light and Traction Co., a New York organization, controls both companies.

United Gas Public Service Co. Brings in Large Gasser in Rodessa

Lake Holt No. 1 gas well in the Rodessa, La., gas field in northern Louisiana, is reported to have been brought in at an estimated rate of 60,000,000 cubic feet at 5,743 foot depth by United Gas Public Service Co., owner of the well.

Donald Hoover Now Dept. Head With No. Indiana Public Service

Donald J. Hoover, assistant city editor of the Indianapolis Daily News, has been named to head the public relations department of the Northern Indiana Public Service Co. at Hammond, Ind.

Lone Star's Vehicle Operation Record Shows Low Accident Rate

THE effectiveness of the safety program being carried on by Lone Star Gas Co, Dallas, Texas, under the direction of A. W. Breeland, safety director for the Lone Star System, is shown by the following statistics on motor vehicle accidents within the organization for 1932.

With only 12 accidents during a total run of 529,343 miles, Fort Worth division's fleet of 47 automobiles established a record for 1932 of a total accident cost of only $67.34. Property damage claims paid by the insurance company totaled $45.07, while cost of repairing company cars was $27.27. No public liability claims were paid during the entire year.

The report further shows the number of accidents per 100,000 miles was only 2.27, with an average mileage of 44,112 per accident. Average direct cost per accident amounted to $5.61.

During the five-year period ending December 31, 1932, the fleet set up a record of 1,296,878 total no-accident mileage.

The number of accidents per year has steadily decreased since 1929. There were 43 accidents in 1928, 49 in 1929, 23 in 1930, 15 in 1931 and only 12 in 1932. Effectiveness of the company's safety program is further evidenced by the steadily increasing number of full time drivers without accident during a year's period. In 1928 there were 12, but there were 15 in 1929, 23 in 1930, 32 in 1931 and 34 in 1932.

A. T. Schultz Takes A. B. Aasness' Place at Great Falls

A. B. Aasness, Montana manager for Northwest States Utilities Co., Great Falls, Mont., has been transferred to the Black Hills District of the Montana-Dakota Power Co. in North Dakota. His position at Great Falls has been filled by A. T. Schultz, manager of the Havre-Chinook Division of the company, which headquarters at Havre.

Boilers at Shrewsbury Plant Changed Over to "Natural"

St. Louis County Gas Co., Webster Groves, Mo., has changed the boilers of its Shrewsbury plant over to burn natural gas for its gas manufacturing operations. The company serves mixed natural and manufactured gas in its system which includes Webster Groves and other towns in St. Louis County.

North American Gas Co., Ltd., Incorporated at Edmonton, Alberta

The North American Gas Co., Ltd., has been formed at Edmonton, Alberta, Canada, with a reported capitalization of $30,000,000 to operate in Alberta under a Dominion Charter. J. W. Heffernan is president of the company, which it is reported was formed through the consolidation of 50 companies.

Frank Wilson to Manage Alexander, Ia., Compressor Station

Frank Wilson, of Tulsa, Okla., has been appointed manager of the compressor station of the Missouri Valley Pipe Line Co. at Alexander, Iowa, following the transfer of Harry Schuyler to Albert Lea, Minn.

If Pressure Drops + + +

Flow will STOP *altogether*

C-F

A HEALTHY pressure or none, must be the aim in some uses of gas. It may be that a well needs to be protected from depletion, or that gas needs to be kept at higher pressure in one part of a line or system than in other parts. Set the *Fulton Back-Pressure or Check-Pressure Regulator* for any desired minimum, and gas will flow only while pressure on the inlet side remains above that minimum. When pressure drops, it will no longer hold the valve open against the weights imposed; and therefore flow ceases.

C-F regulators have been known as the best for over forty years. Correspondence is invited concerning any requirement of pressure control for gas, oil, steam, water, etc. Circulars on request.

The Chaplin-Fulton Manufacturing Company

Organized 1884—Oldest Builders of Gas Regulators in the Country. Regulators in all Sizes from 1 inch to 24 inches; for all service, 1 oz. up to 2,000 lbs. pressure to square inch.

28-40 Penn Avenue **Pittsburgh, Pa.**

REPRESENTATIVES

WESTCOTT & GREIS, Inc.
Sales and Service
Dallas — Tulsa

JNO. W. CRAWFORD
Sales Engineer
1855 Industrial Street, Los Angeles

PARSONS ENGINEERING CO.
Los Angeles, Calif. San Francisco, Calif.

Or Any Jobber

FULTON Back-Pressure REGULATORS

SOMETHING NEW

Radiant Front Circulating Heaters

A new and complete line of Fraser Radiant Front Circulating Heaters. The most outstanding circulator on the market today. Fraser has developed an entirely new type of circulating heater. You must see it to appreciate its contribution to gas heating.

Floor Furnaces—Wall Furnaces—Basement Furnaces—Pipeless Furnaces—Console Circulating Heaters—Furnace Fans and Filters.

Write for our new catalog and price list.

Manufactured by

Fraser Furnace Company
Stockton, Calif.

Distributed by

H. R. BASFORD CO. San Francisco Los Angeles

SOUTH CHESTER STEEL PIPE

Excels for Gas Service

The unusual care given to accuracy of diameter and welding qualities, makes Chester Pipe a favorite for gas lines.

SOUTH CHESTER TUBE CO.
Chester, Pa.

Complete House Heating Sales Program Includes "Renovizing" Jobs

THE month of July saw the inauguration of a new house heating program in the Gas Service group of properties, headquartered at Kansas City, Mo., which will extend to the last of August, and includes the marketing of new gas designed furnaces, the marketing of a new thermostat, the employment of a new system of baffling developed by Gas Service Co. engineers for warm air furnaces and hot water and steam boilers, and the "renovizing" of conversion jobs previously installed by the company.

The two new developments in control and baffling are designed to add to the heating efficiency of conversion jobs, giving the customer an added saving in fuel bills.

The new thermostat is known as a high and low control and is manufactured by the Minneapolis-Honeywell Regulator Co. The low control permits only about 50 to 60 per cent of the maximum demand of gas to be used. If this is not sufficient for the area to be heated, the high control, which provides the maximum of gas, is automatically turned on.

When considerable heat is necessary to get the desired temperature, the thermostat opens the high control, providing the maximum of heat. When the temperature reaches the required degree, the thermostat shuts off the gas, and from then on, unless more heat is required to keep the temperature at the desired degree, only the low demand control will turn on.

Plans being offered during the house heating program include the installing of conversion burners for customers who are in the market for that type of heating, along with special effort to install complete gas designed furnaces. As a special feature, "renovizing" jobs will be sold to customers who already have conversion burners, but who desire the added efficiency of the new baffling and the high and low control thermostat.

The baffling was designed by C. C. Young, engineer in the new business department of Capital Gas & Electric Co. at Topeka, Kan., who was a designer of the leaning radiant type of conversion burner. The number of baffles to be used varies depending on the furnace in which the installation is made. The baffling will be located in the head drum of the furnace.

The months of July and August will be devoted by the Gas Service new business departments to the sale of large-capacity heating equipment, the smaller appliances being featured during September, October and November.

Taxes Take 56 Cents of Every Lone Star Gas Bill

A STATEMENT showing that taxes take 56 cents of every gas bill rendered by Lone Star Gas System is appearing on bills now being sent out by distribution companies of the system, which include the Community Natural, Municipal, Fort Worth Division, Dallas, Stamford & Western and Texas Cities companies.

The statement, which is printed on the face of the postcard bill, reads: "An average amount of 56 cents for every monthly gas bill rendered on Lone Star Gas System is required for taxes. The company has no control over this item of expense which must be included in the cost of natural gas service rendered to you."

This statement will appear on all gas bills for several months, in line with the company's custom of printing some type of advertising or information on the face of its bills.

This average of 56 cents for every bill, according to company officials, applies to the entire system, but since the bills were printed it has been found that the new capital stock tax of the Federal Government will increase the amount to 60 cents per bill. The average for the Fort Worth Division will be more than 70 cents per bill.

The natural gas industry in Texas is required to pay four special tax levies in addition to many other taxes. Two of these are levies which no other utility is required to pay. The gas companies pay an annual franchise tax. The gas distribution companies pay ½ of 1 per cent of their gross receipts in all cities and towns with a population of from 2,500 to 10,000 and 1 per cent of their gross receipts in towns of over 10,000 population. A gross production tax of 2 per cent is levied on all natural gas, and the fourth special tax is a levy of ¼ of 1 per cent on the gross receipts of pipe line companies.

In addition to these special state taxes, the gas companies are required to pay revenue stamp taxes, ad valorem taxes levied by road districts, water improvement districts, levee districts, independent school districts, Federal income taxes, and ad valorem taxes levied by various city, county and state governments.

Such taxes must be charged as an operating expense to the customer, because the law makes the company merely a collector of the tax.

Walter T. Reid Now President of Albuquerque Natural

Walter T. Reid, vice-president of Southern Union Gas Co., Dallas, Texas, has been named president of the Albuquerque Natural Gas Co., succeeding A. T. Woods, resigned.

New Gas Holder at Cedar Falls

Cedar Falls Municipal Gas Department, Cedar Falls, Iowa, has begun construction of a 150,000 cubic foot gas holder.

100 Years of Development in Refrigeration, Subject of Monograph

The Chicago Century of Progress science exhibit on automatic refrigeration is the inspiration for a monograph reviewing 100 years of scientific development in that field, issued by Electrolux Refrigerator Sales, Inc., in conjunction with its demonstration at the Chicago fair.

The report titled: "1833-1933" traces the beginning of automatic refrigeration 178 years ago and discloses the successful laboratory quest of two young students—Baltzar von Platen and Carl G. Munters of Stockholm's Royal Institute of Technology, for a refrigerant that could be made to circulate, vaporize and condense through the use of heat rather than machinery. The monograph reports that their experiments proved their theory correct, and for machinery they substituted a gas flame. The practical application of the discovery resulted in the gas refrigerator, the monograph states.

F. E. Sellman, vice-president of Electrolux Refrigerator Sales, Inc., announced that the monograph would be distributed throughout the country within the next few weeks to stimulate interest in the exhibit at the Chicago fair and to focus attention on the present national newspaper advertising campaign in the interest of the new waterless air-cooled gas refrigerator.

John B. Tonkin to Head Two Standard Oil Subsidiaries

JOHN B. TONKIN, for many years vice-president and general manager of the Peoples Natural Gas Co., Pittsburgh, Pa., has been elected president of the company and its affiliate, the Columbia Natural Gas Co., succeeding Christy Payne, who has been elected vice-president and treasurer of the Standard Oil Company of New Jersey. Mr. Tonkin's appointment comes after a career of nearly 40 years with the organization and its associated companies, 15 of which have been passed as vice-president and general manager.

Mr. Tonkin is well known in the western gas industry, being active in the affairs of the Natural Gas Department of the American Gas Association, and nominated as vice-chairman of the Department for the coming Association year. He is also a past president of the Pennsylvania Natural Gas Men's Association.

J. French Robinson has been made vice-president of Peoples Natural Gas Co., succeeding Mr. Tonkin. Mr. Robinson has been with the company since 1920 as geologist and engineer.

New Officers Inducted in S. F. Unit of Gas Appliance Society

Roy Stanforth, manager, household department, Lachman Bros., was elected president of the San Francisco Unit of the Gas Appliance Society of California at its annual business meeting held on July 13. Clinton Fortune, of the Spark Stove Shops, was elected vice-president, with Graydon A. Milton, of the Pacific Gas and Electric Co., as secretary-treasurer.

DIRECTORY

Byllesby Engineering and Management Corporation

Wholly-owned subsidiary of Standard Gas and Electric Company

231 South La Salle Street, Chicago
New York Pittsburgh San Francisco

PETER B. DOUB
Accountant and Auditor
COST SYSTEMS BUDGET PLANS
848 West 42nd Street Los Angeles, Calif.
Telephone ADams 0512

J. KAPLAN
PATENT ATTORNEY
Washington Loan & Trust Bldg.
Washington, D. C.
U. S. and Foreign Patents
Trade-marks
Agents in all Foreign Countries

QUIET
GENERAL MAGNETIC GAS VALVE FEATURES: Electric Hum Eliminated, ½-3" sizes. Low and High Voltage. Built for High Pressure Gas. Made in slow-opening types. Simple in Design—Infallible in Operation—Low in Price.
GENERAL CONTROLS CO., LTD.
1539 Folsom St. San Francisco
Jensen Instrument Company Los Angeles Distributors

SHEER 31-A MOTOR GAS VALVE Now Entering Its Third Year
LEADS IN PERFORMANCE AND LOW PRICES
Also Hi-Lo Gas Valve, Step-Opening Gas Valve, Thermostats, Safety Pilots, Limit Controls, Space Heater Regulators, Humidifiers, Etc. . . . .
WRITE FOR CATALOG
H. M. SHEER CO., QUINCY, ILL.

HOLZAPFEL GAS CARBURETERS
Best Yet Lowest Priced
Phone or Write for Folder
Holzapfel Instrument Co. VAndyke 0187
1201 Santa Fe Ave., Los Angeles

SUPERIOR
Hot Water Service
is being obtained by users of the
HOTZONE "SPECIAL"
(Budget type)
Self-action Storage Gas Water Heater

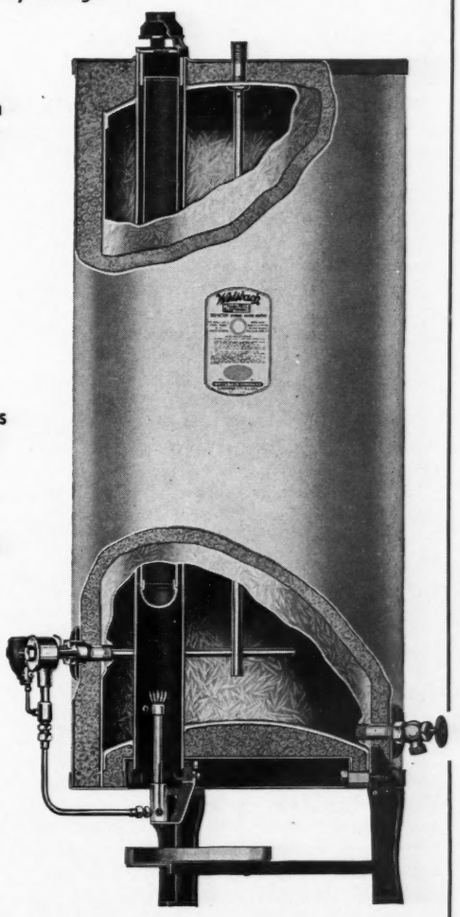
Heater is correctly designed
Hourly input rating 2500 to 5500 B.T.U.
Insulated with Reflexcell Fluted Fibre
Stand-by gas consumption is low
Efficiency is high

Furnished with Galvanized or Everdur tank 300 lb. test

Made in 45 and 60 gallon sizes

Welsbach Highly Developed Safety Devices are furnished

Please tell us to send further details



Approved by A.G.A. Laboratory

Welsbach COMPANY
Gloucester, N. J.

50 Hawthorne St. San Francisco, Calif.
226 S. Wabash Ave. Chicago, Ill.

Gas Appliance Service Range Manual Off the Press

THE first volume of the series of Service Manuals to be issued by the American Gas Association is now off the press, and is called the Gas Appliance Range Manual. The book contains 75 pages giving the physical details of installing and adjusting the gas range. It is a work-a-day tool designed for the fitter to take with him—slipping into a pocket or work kit. The illustrations show graphically what the fitter should do to service a gas range. Attention is given to all makes of thermostats.

Among the many noteworthy features the following may be cited: A section devoted to the layout and design of kitchens so that either a home service worker or a service man can help the housewife in locating a new range. A section is devoted to hints for dealing with high bill complaints and also for saving gas. A definite statement has been made to standardize on a correctly adjusted top burner flame so that the maximum efficiency which the gas range can develop may be secured. Convenient tables assist in the selection of the right size gas orifices.

Following this material the balance of the book is devoted to a detailed consideration of the controls found on the various makes of gas ranges. The pictorial presentation represents a new departure which should prove helpful. The book was prepared under the direction of the Committee on the Manual, E. R. Rothert, chairman; and R. M. Conner, H. E. Heil, C. R. Miller, T. J. Perry and with C. G. Segeler of American Gas Association Headquarters Staff, as secretary. Prior to its release the book was examined by leading distribution and service engineers in a number of gas companies.

The series will include manuals on every gas appliance which the fitter is called upon to service and adjust.

San Francisco Health Department Reauthorizes Methylene Blue

Following further research on the methylene blue treatment for carbon monoxide poisoning, Dr. J. C. Geiger, director of the Department of Public Health for the City and County of San Francisco, San Francisco, Calif., has reauthorized its use in cases under his care up to a maximum of 150 c.c. of 1 per cent solution within a period of two hours.

Early in December, 1932, following tests at the University of California in the use of methylene blue dye on animals asphyxiated with carbon monoxide, Dr. Geiger called for the treatment in all cases of carbon monoxide poisoning received in San Francisco emergency hospitals. The treatment was described in the February issue of *Western* Gas, page 20.

The experience of workers in the Department of Public Health under Dr. Geiger has indicated that methaemoglobin is not formed in measurable quantities after the injection of methylene blue, as other investigators had claimed.

The treatment is also authorized in cases of cyanide poisoning.

Panhandle Eastern May Build Gas Line from Moberly to Macon

Following the purchase of the Macon Gas and Electric Co., Macon, Mo., by Panhandle Eastern Pipe Line Co. of Kansas City, Mo., announcement was made that the latter company plans to construct a 25-mile natural gas transmission line from Moberly to Macon, supplying that city with natural gas from its main line.

To Build 157-Mile Line Out of Central Michigan Gas Field

Michigan Natural Gas Corp., Mt. Pleasant, Mich., is reported to be going ahead with its plans for constructing a 157-mile natural gas transmission line from Central Michigan fields to Pontiac and Flint, Mich., with lateral lines to Bay City and Saginaw. Survey for the lines was reported underway in Ju'y. Cost of the development is estimated at more than $3,000,000.

H. L. Geisse Now With the Byllesby Central Staff in Chicago

John J. O'Brien, president of Byllesby Engineering and Management Corp., announces that Harold L. Geisse, former president of Wisconsin Valley Electric Co., has joined the operating staff of Byllesby Engineering and Management Corp. in Chicago.

Mr. Geisse has had extensive experience in the public utility industry. Since 1922 he has managed the Wisconsin Valley Electric Co. properties, continuing to act in a managerial capacity when these properties were taken into the Standard Gas and Electric Co. system in 1927. The recent merger of Wisconsin Valley Electric Co. with Wisconsin Public Service Corp. has made possible this appointment for Mr. Geisse.

United Gets Injunction vs. Texas Commission in Laredo Case

United Gas Public Service Co. has won its case in the federal district court at Houston, Texas, when a temporary order was issued restraining the state Railroad Commission from enforcing an order to lower gas rates in Laredo, Texas. The Railroad Commission had ordered the rates cut from 75 cents per M c. f. to 55 cents per M c. f.

New Personnel Appointed on Arizona Corporation Commission

A new personnel has taken office on the Arizona Corporation Commission with the appointment of three new members by Governor Moeur. The following make up the Commission: Wilson T. Wright of Globe, chairman; John Cummard of Mesa, and Charles R. Howe, with M. C. Hankins of Phoenix as secretary.

Change in Rate Schedule for Minneapolis Gas Light Co.

A new schedule of gas rates is being made up by the Minneapolis Gas Light Co., Minneapolis, Minn., for consideration by the city council's natural gas committee. The new rate schedule will be applicable should natural gas service become available.

Classified Advertising

Classified advertising five cents per word; minimum $2.00 per insertion. Situation Wanted advertisements up to 50 words will be published three consecutive issues without charge. Small professional cards 1-in. deep by 21 ems wide are $6.00 monthly on 12-time contract.

General Classified

Wanted: to purchase interest in natural gas acreage with large open flow and good market possibilities. Can handle construction, financing and operation at minimum cost, or interested purchasing propane bottled gas company. Seeking connection with future. Can furnish bank and business references. Address Box E-234 *Western Gas,* 810 South Spring Street, Los Angeles, Calif.

Situations Wanted

Meter repairman with four years experience in meter repairing, both tin and iron case, large and small capacity meters, desires permanent connection with reliable company. References. Address Box E-233, *Western Gas,* 810 South Spring Street, Los Angeles, Calif.

Help Wanted

Wanted: Experienced furnace salesmen for Los Angeles and other cities. Williams Radiator Company, 1865 West Cordova Street, Los Angeles.

Death of C. O. Dunten of Sand Springs, Okla.

C. O. Dunten of Sand Springs, Okla., president of the Oklahoma Power and Water Co., executive board member and second vice-president of the Oklahoma Utilities Association passed away suddenly on July 8, following an attack of apoplexy.

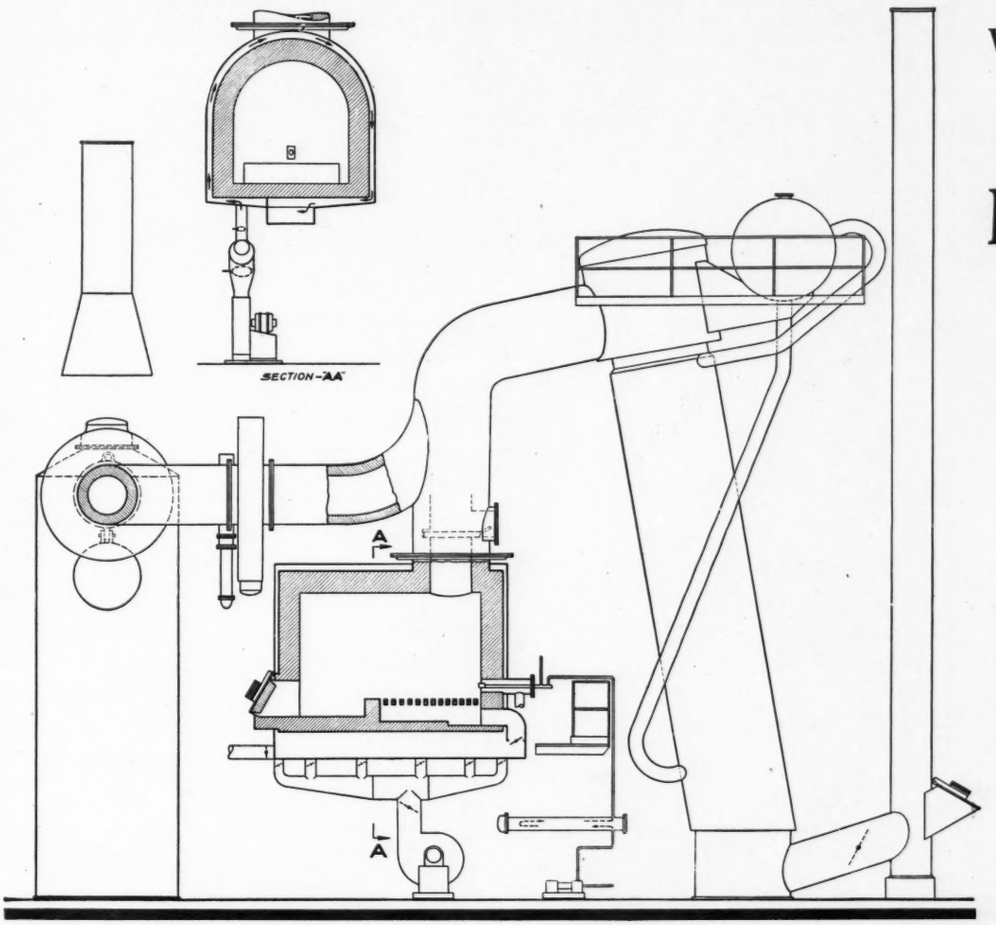
Mr. Dunten succeeded S. E. Wolf as head of Oklahoma Power and Water Co. about a year and a half ago, going to Oklahoma from Central and Southwest Utilities Co. at Dallas, Texas. He was a native of Indiana and was graduated from Purdue University in that state.

He is survived by his wife, a son and a daughter.

Dallas Gas Co. Spending $40,000 in Main Replacement Work

Approximately $40,000 in main replacement work is now under way by the Dallas Gas Co., and according to R. M. Redding, general superintendent for the company, this amount will be increased to $110,000 by the end of the year if the work continues at the present rate.

PRESENTING THE SEMET-SOLVAY



WASTE HEAT
and
FUEL FIRED
BOILER
with
Automatic Cyclic
Control

(Patent Applications Pending)

THIS Semet-Solvay Waste Heat Boiler is of improved design and high efficiency. It delivers steam most economically. In a water gas plant, it may be operated either by the blast gases only, or by the blast gases in automatic cycle with our fuel fired combustion unit (as illustrated), burning surplus tar or low grade oil. The equipment requires very little space and no additional plant labor, the operating being entirely automatic. It can be installed on a basis that will return the capital investment through reduced steam costs in a surprisingly short time.

Let us work it out for your plant.

SEMET-SOLVAY
ENGINEERING CORPORATION

Engineers ▾ ***Contractors***

40 RECTOR STREET ▾ **NEW YORK, N.Y.**

STILL TIME TO REGISTER

in A.G.A. summer Electrolux contest!

$1500.00

in Cash Prizes

for the utility sales organizations selling

MOST ICE CUBES

during July, August, September and October

USES NO WATER
REG. U.S. PAT. OFF.

THE hot summer months ahead offer a golden opportunity to every gas company for the sale of automatic gas refrigerators!

People are refrigeration-minded today. And we have a product that is far superior to competition—the New Air-Cooled Electrolux! But to get the business for gas means vigorous and sustained effort.

As an added incentive, therefore, your Refrigeration Committee is sponsoring a summer sales prize contest on Electrolux Refrigerators. Prizes are $750 (first), $500 (second), and $250 (third). The contest is so arranged that any sales organization, large or small, can participate with a good chance of winning.

Remember, every Electrolux installed adds approximately 1500 cu. ft. to a customer's load. Promotes the use of gas as the modern fuel. Takes the small convenience user out of the non-profit class, and protects your investment of $250 or more tied up in every meter.

We hope every retail sales organization will enter this contest. With everybody behind it, we will have established a precedent in Gas Association activities never before equalled. If you haven't registered yet, we urge you strongly to do it —*now!*

Refrigeration Committee
American Gas Association
420 Lexington Ave.,
New York, N. Y.

***Mail to*—Mr. J. W. WEST—AMERICAN GAS ASSOCIATION**
420 Lexington Avenue, New York, N. Y.

***Registration Card* FOR SUMMER SALES PRIZE CONTEST ON ELECTROLUX REFRIGERATORS**

*Date*_____

1. _____
(Name of Gas Company—District or Branch)

2. _____
(Number of Retail Meters—1-2-3-4 Family Houses Only)

3. _____
(Name of Local Manager Directly in Charge of Sales Group)